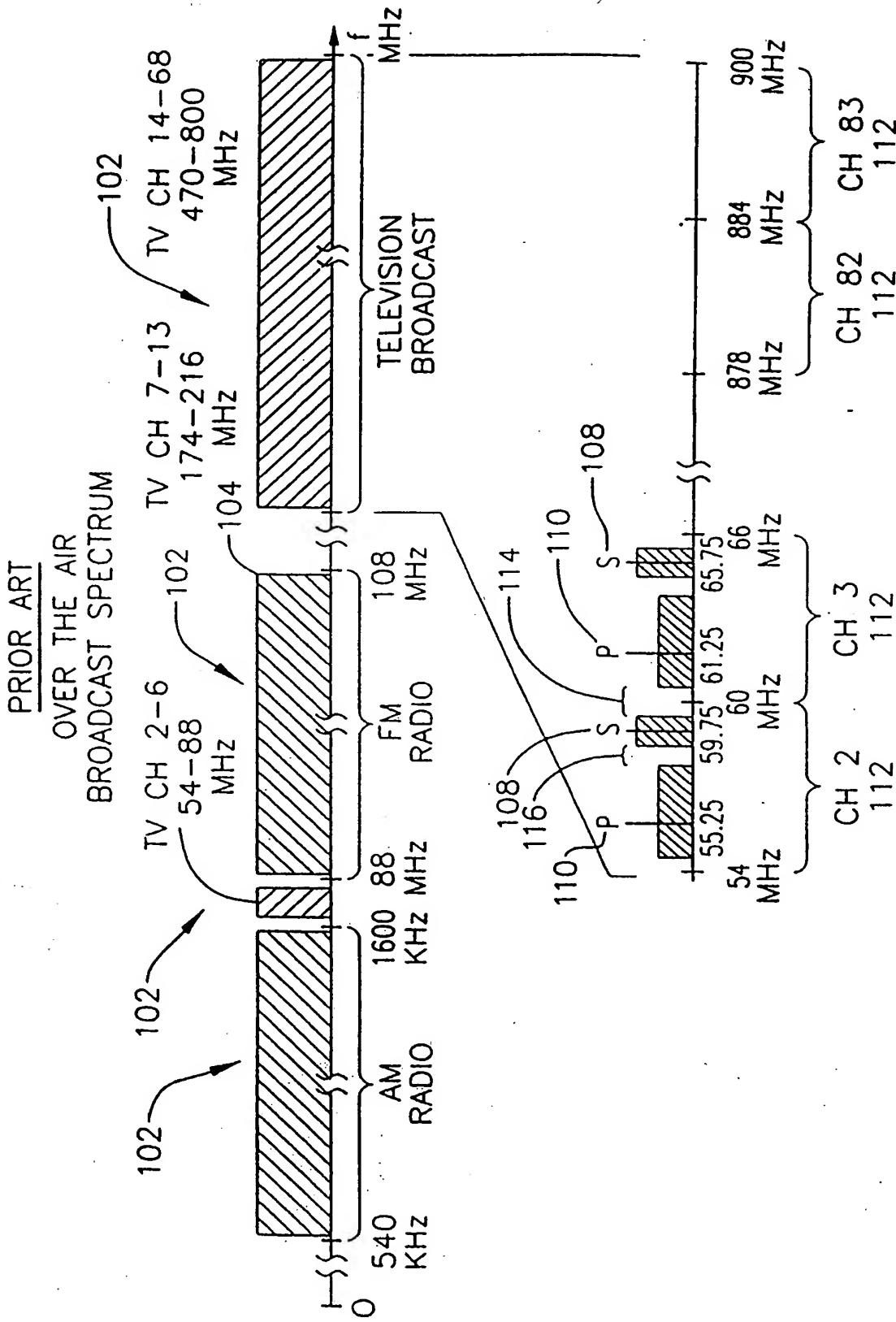


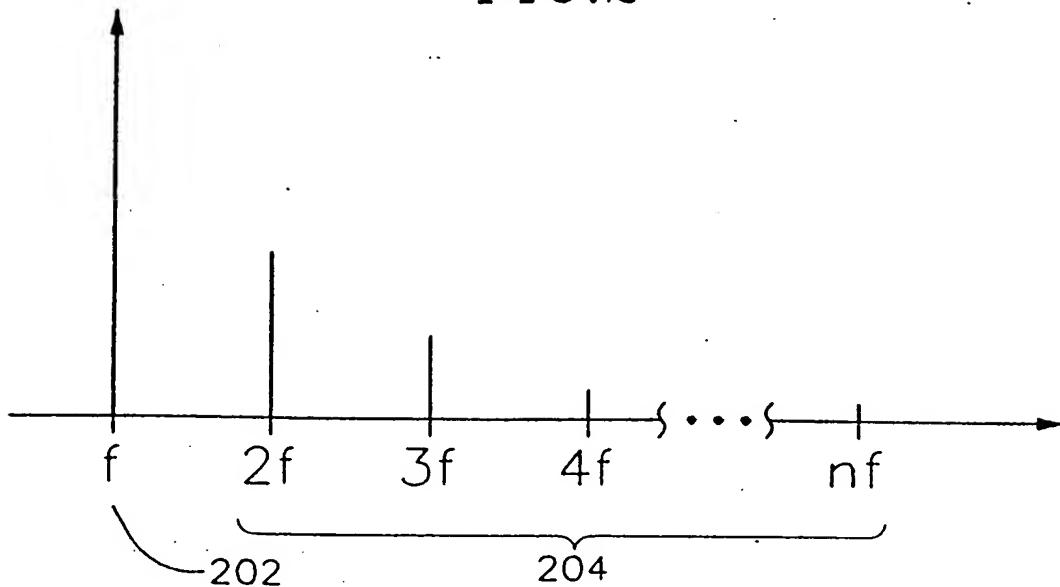
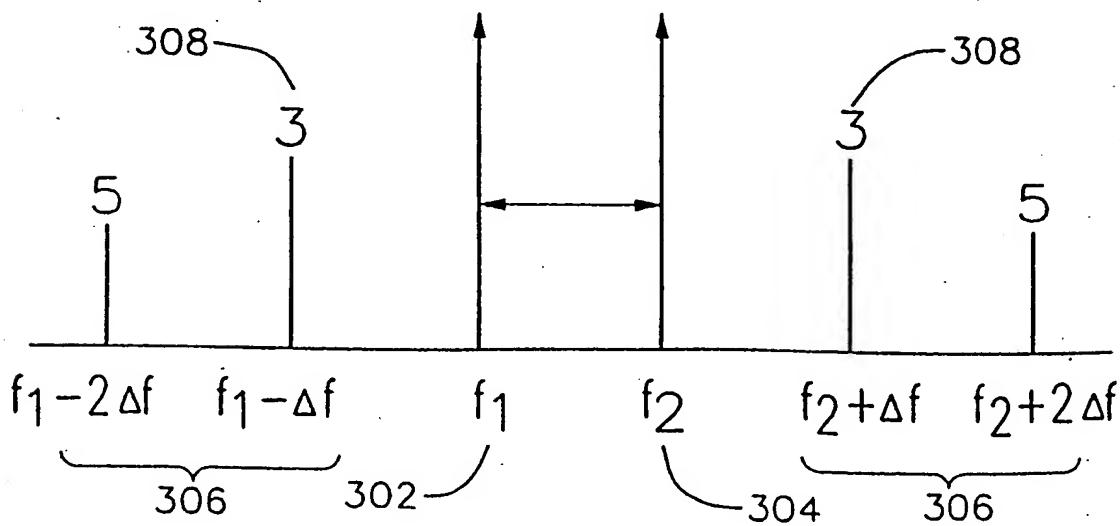
Appl. No. *To Be Assigned*; Filed: *Herewith*
 Dkt. No. 1875.138000G; Group Art Unit: *To Be Assigned*
 Inventors: Arya R. Behzad; Tel.: (202) 371-2600
 Title: Large Gain Range, High Linearity, Low Noise MOS
 VGA

FIG. 1



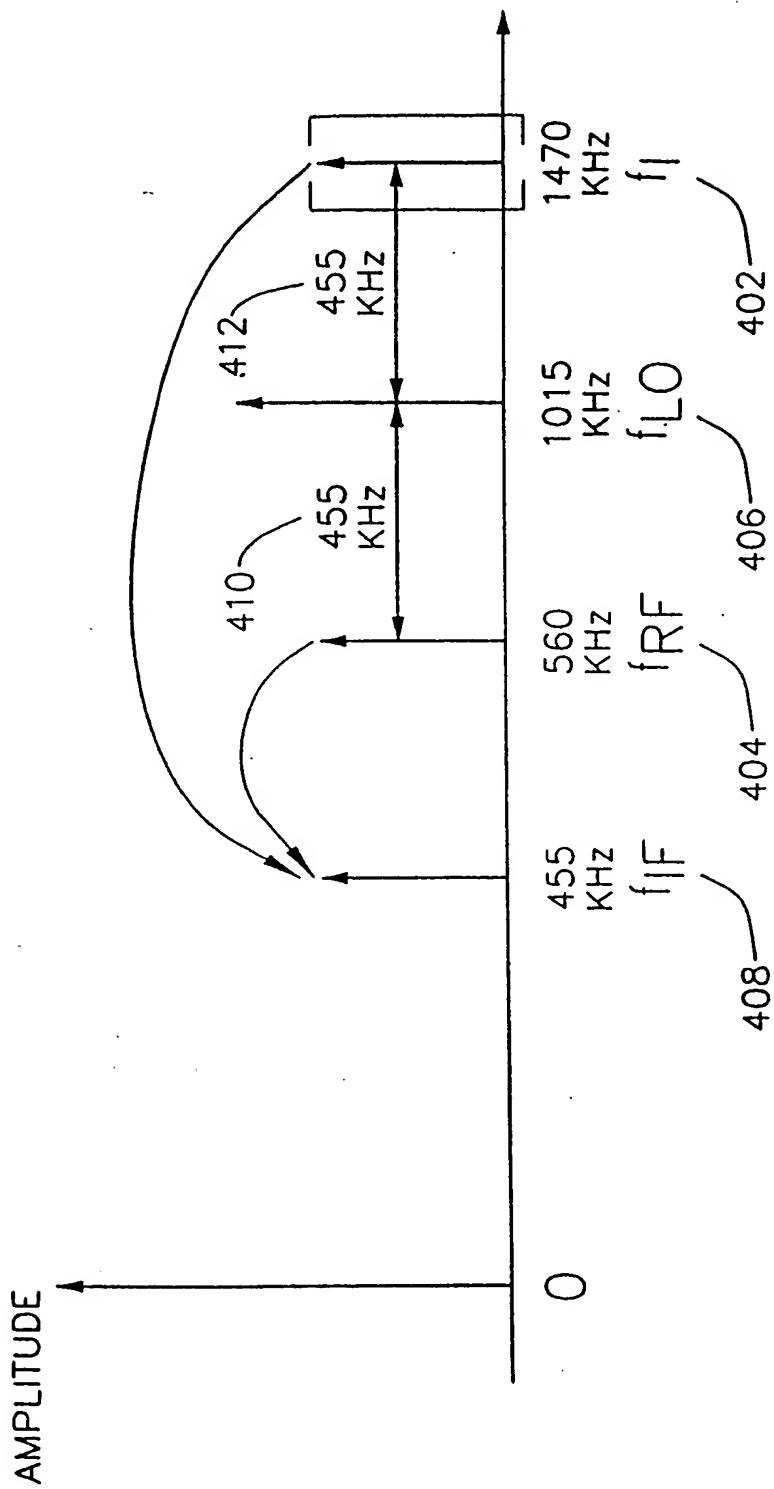
Appl. No. *To Be Assigned*; Filed: *Herewith*
 Dkt. No. 1875.138000G; Group Art Unit: *To Be Assigned*
 Inventors: Arya R. Behzad; Tel.: (202) 371-2600
 Title: Large Gain Range, High Linearity, Low Noise MOS
 VGA

FIG. 2

FIG. 3
PRIOR ART

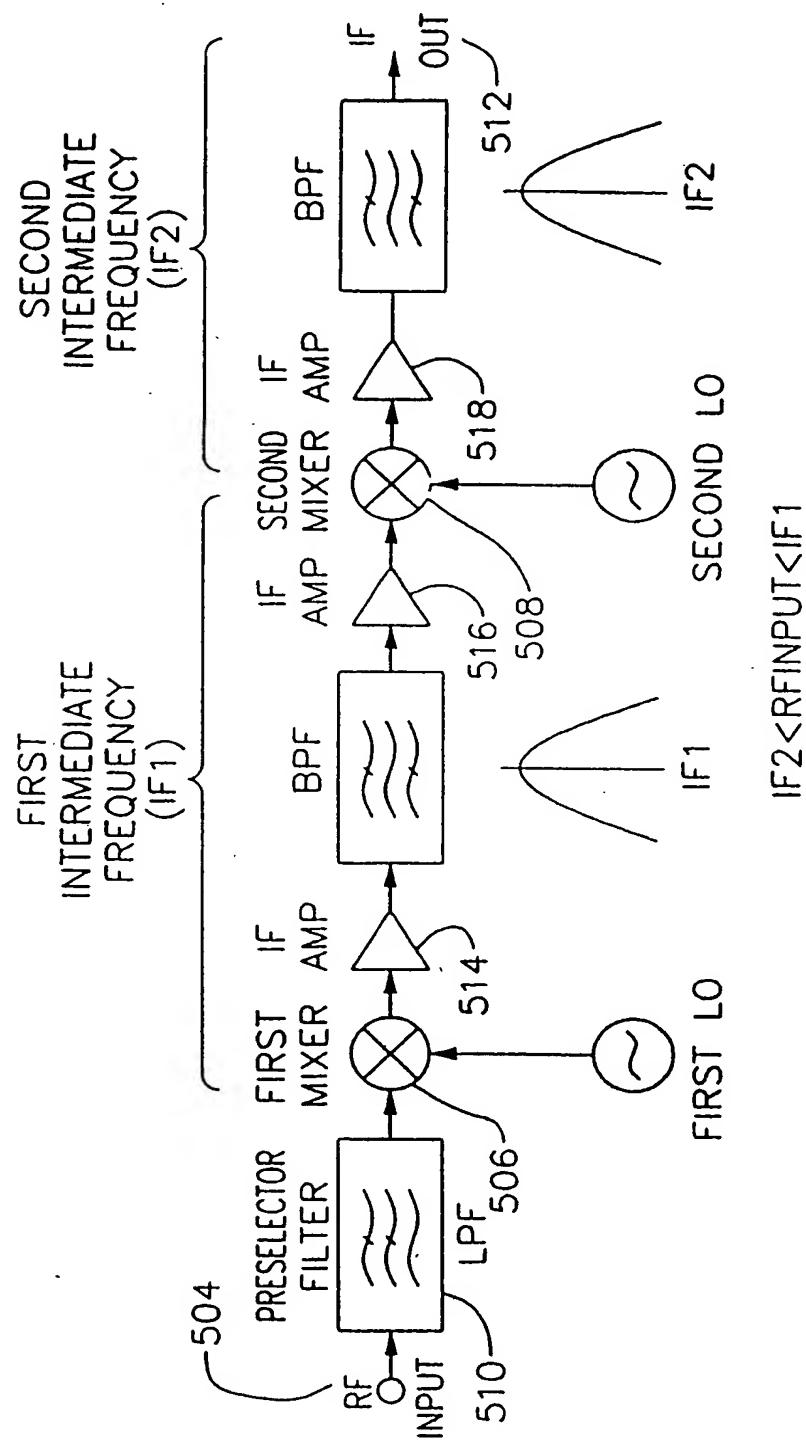
Appl. No. *To Be Assigned*; Filed: *Herewith*
 Dkt. No. 1875.138000G; Group Art Unit: *To Be Assigned*
 Inventors: Arya R. Behzad; Tel.: (202) 371-2600
 Title: Large Gain Range, High Linearity, Low Noise MOS
 VGA

FIG. 4
PRIOR ART



Appl. No. *To Be Assigned*; Filed: *Herewith*
 Dkt. No. 1875.138000G; Group Art Unit: *To Be Assigned*
 Inventors: Arya R. Behzad; Tel.: (202) 371-2600
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 VGA

FIG. 5
DUAL CONVERSION RECEIVER



Appl. No. *To Be Assigned*; Filed: *Herewith*
 Dkt. No. 1875.138000G; Group Art Unit: *To Be Assigned*
 Inventors: Arya R. Behzad; Tel.: (202) 371-2600
 Title: Large Gain Range, High Linearity, Low Noise MOS
 VGA

FIG. 6

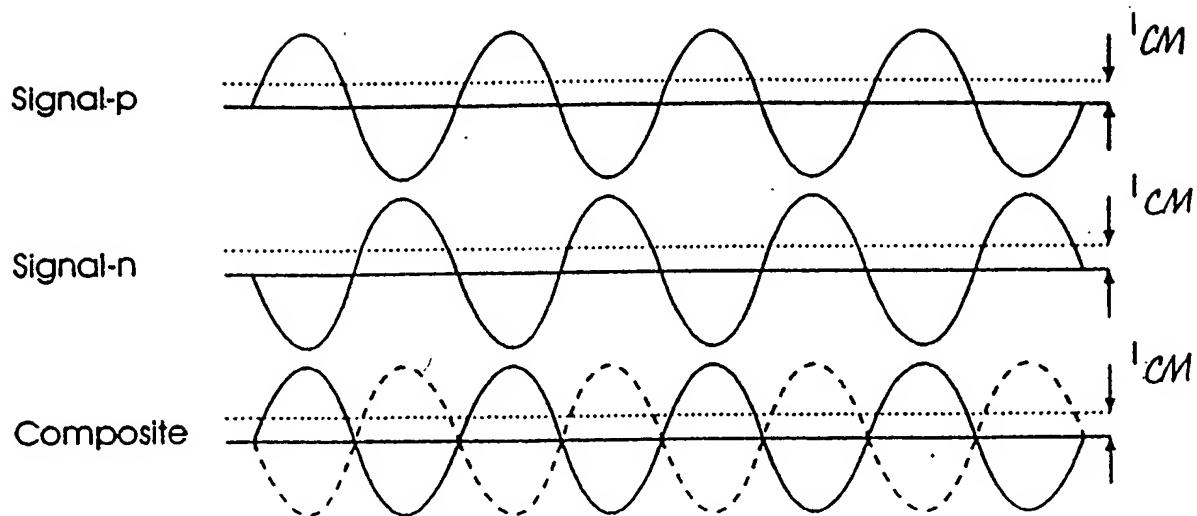
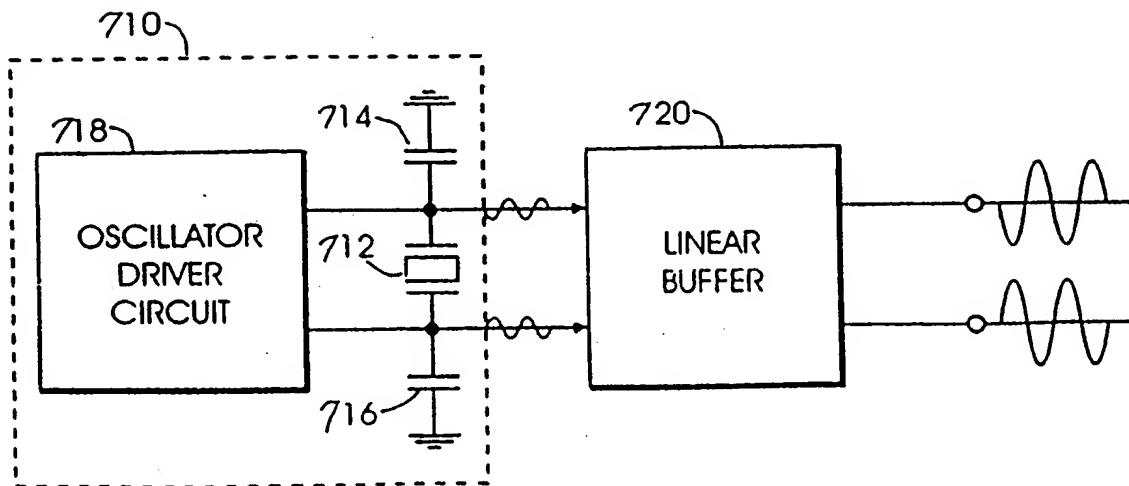


FIG. 7



Appl. No. *To Be Assigned*; Filed: *Herewith*
 Dkt. No. 1875.138000G; Group Art Unit: *To Be Assigned*
 Inventors: Arya R. Behzad; Tel.: (202) 371-2600
 Title: Large Gain Range, High Linearity, Low Noise MOS
 VGA

FIG. 8

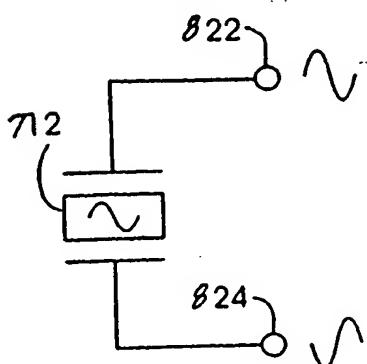


FIG. 9

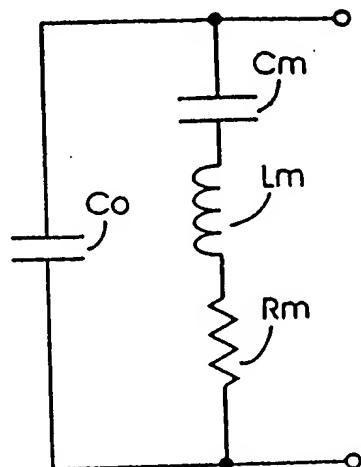


FIG. 10

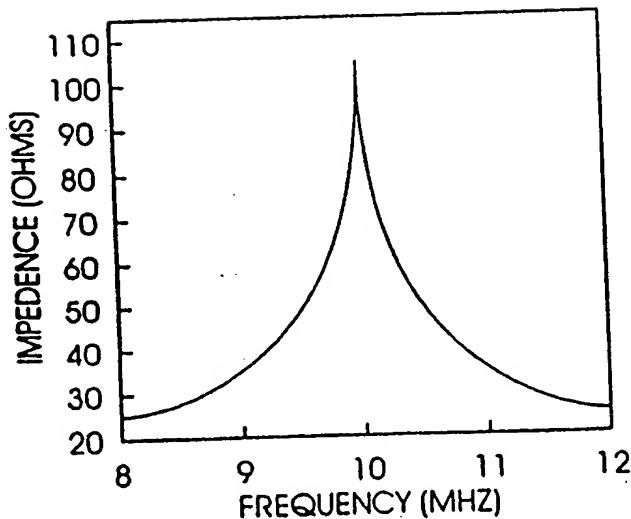


FIG. 11

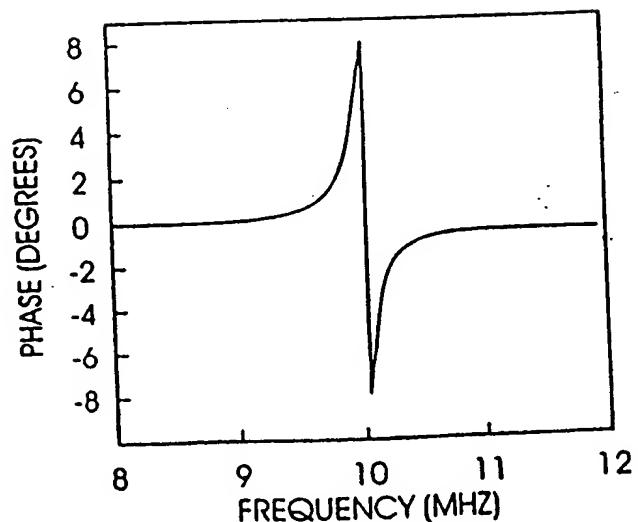


FIG. 12

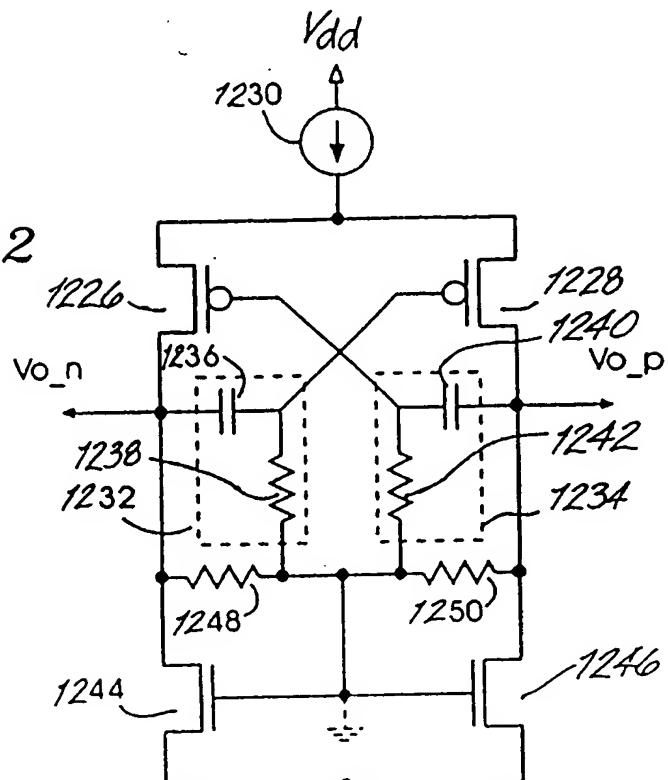
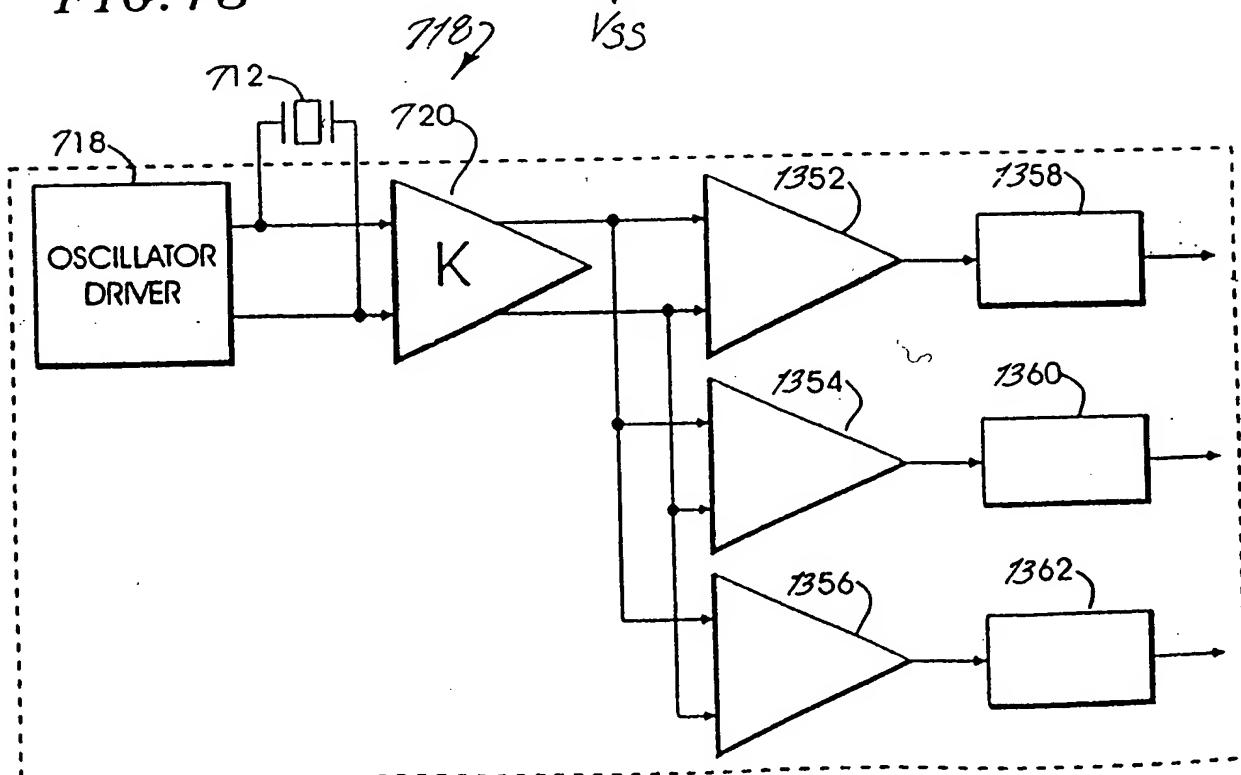
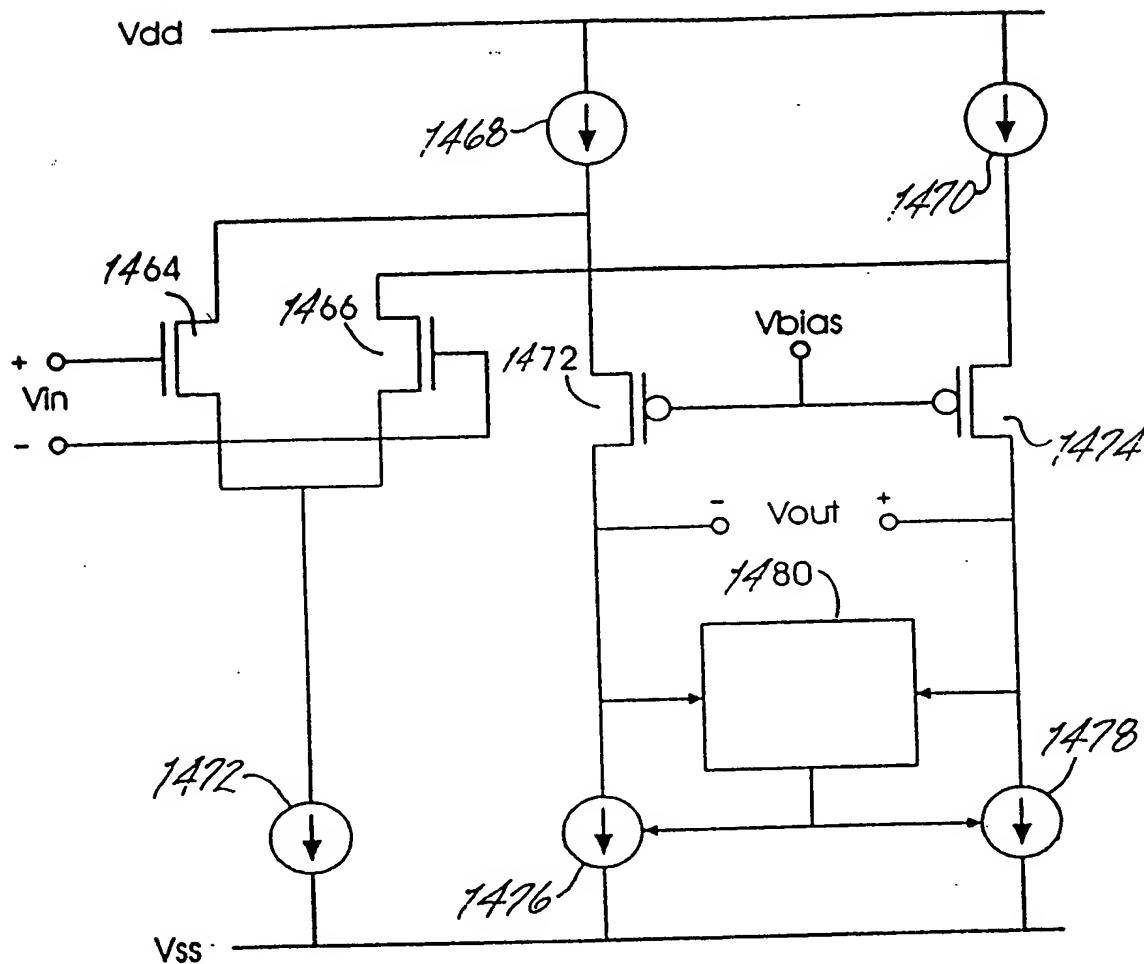


FIG. 13



Appl. No. *To Be Assigned*; Filed: *Herewith*
 Dkt. No. 1875.138000G; Group Art Unit: *To Be Assigned*
 Inventors: Arya R. Behzad; Tel.: (202) 371-2600
 Title: Large Gain Range, High Linearity, Low Noise MOS
 VGA

FIG. 14



Appl. No. *To Be Assigned*; Filed: *Herewith*
 Dkt. No. 1875.138000G; Group Art Unit: *To Be Assigned*
 Inventors: Arya R. Behzad; Tel.: (202) 371-2600
 Title: Large Gain Range, High Linearity, Low Noise MOS
 VGA

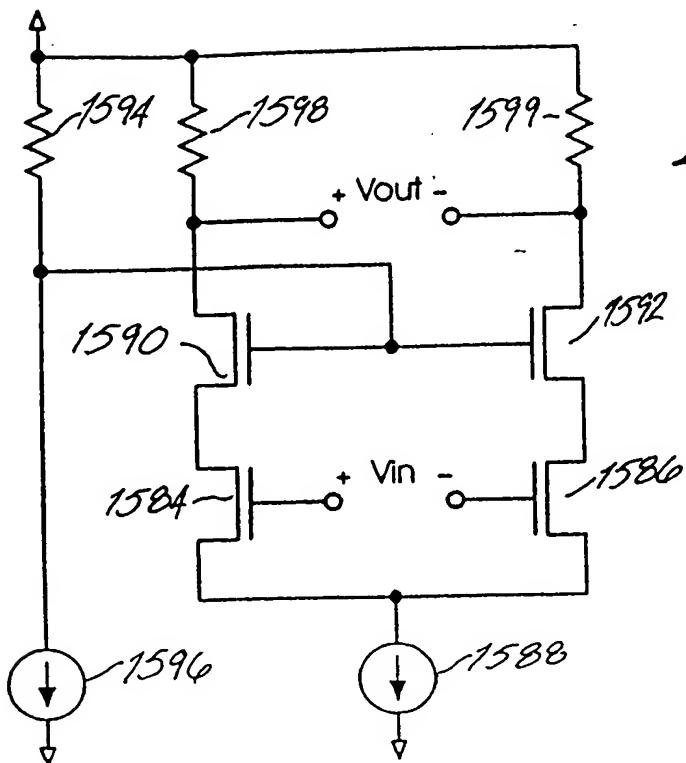


FIG. 15

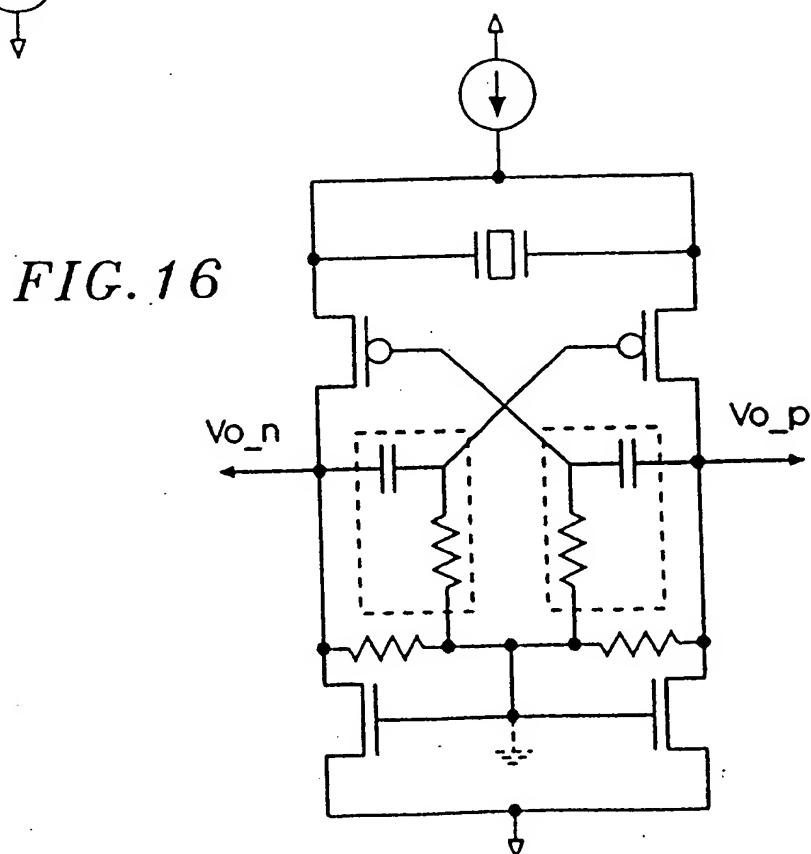


FIG. 16

Appl. No. *To Be Assigned*; Filed: *Herewith*
 Dkt. No. 1875.138000G; Group Art Unit: *To Be Assigned*
 Inventors: Arya R. Behzad; Tel.: (202) 371-2600
 Title: Large Gain Range, High Linearity, Low Noise MOS
 VGA

FIG. 17

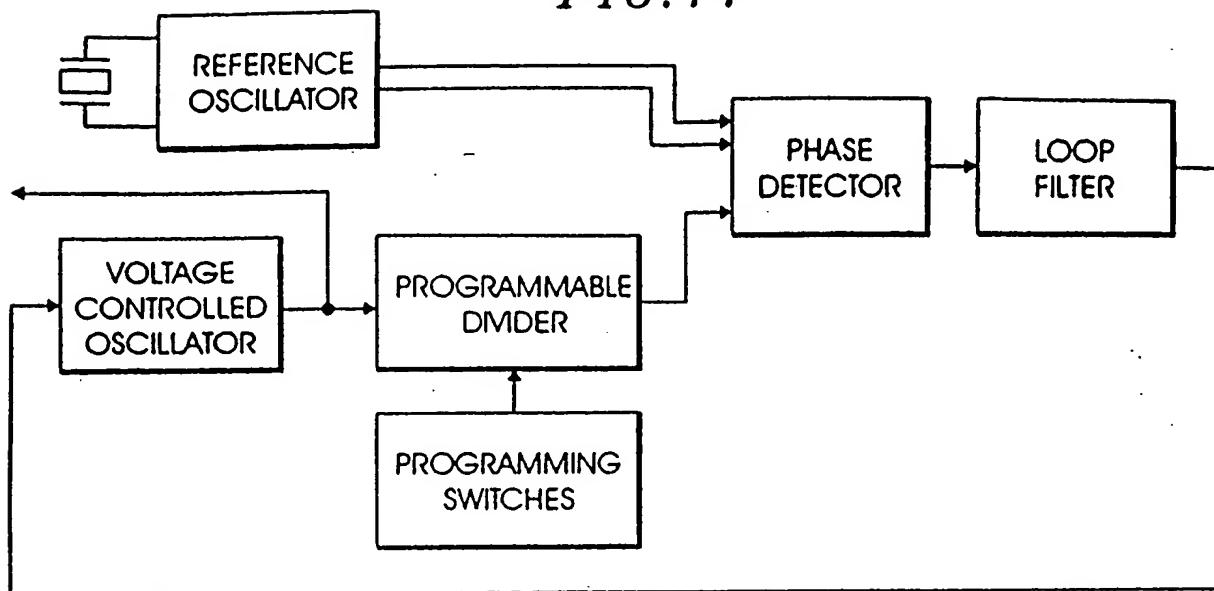
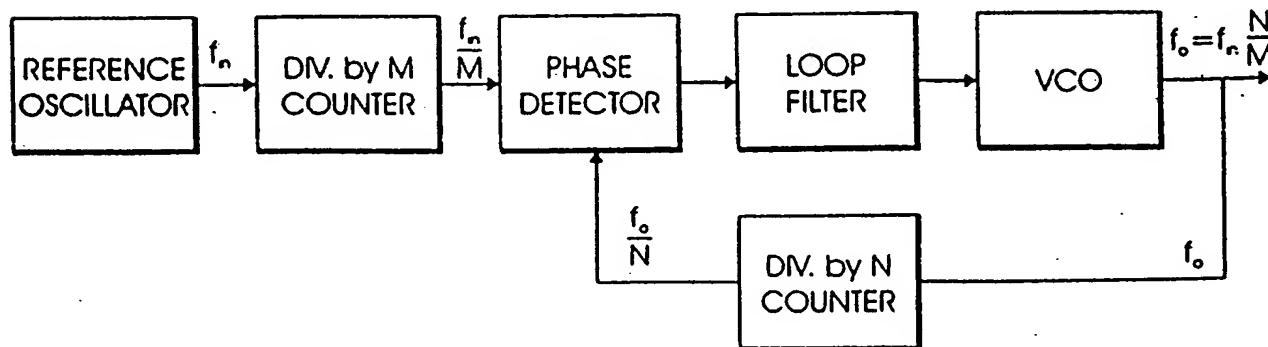
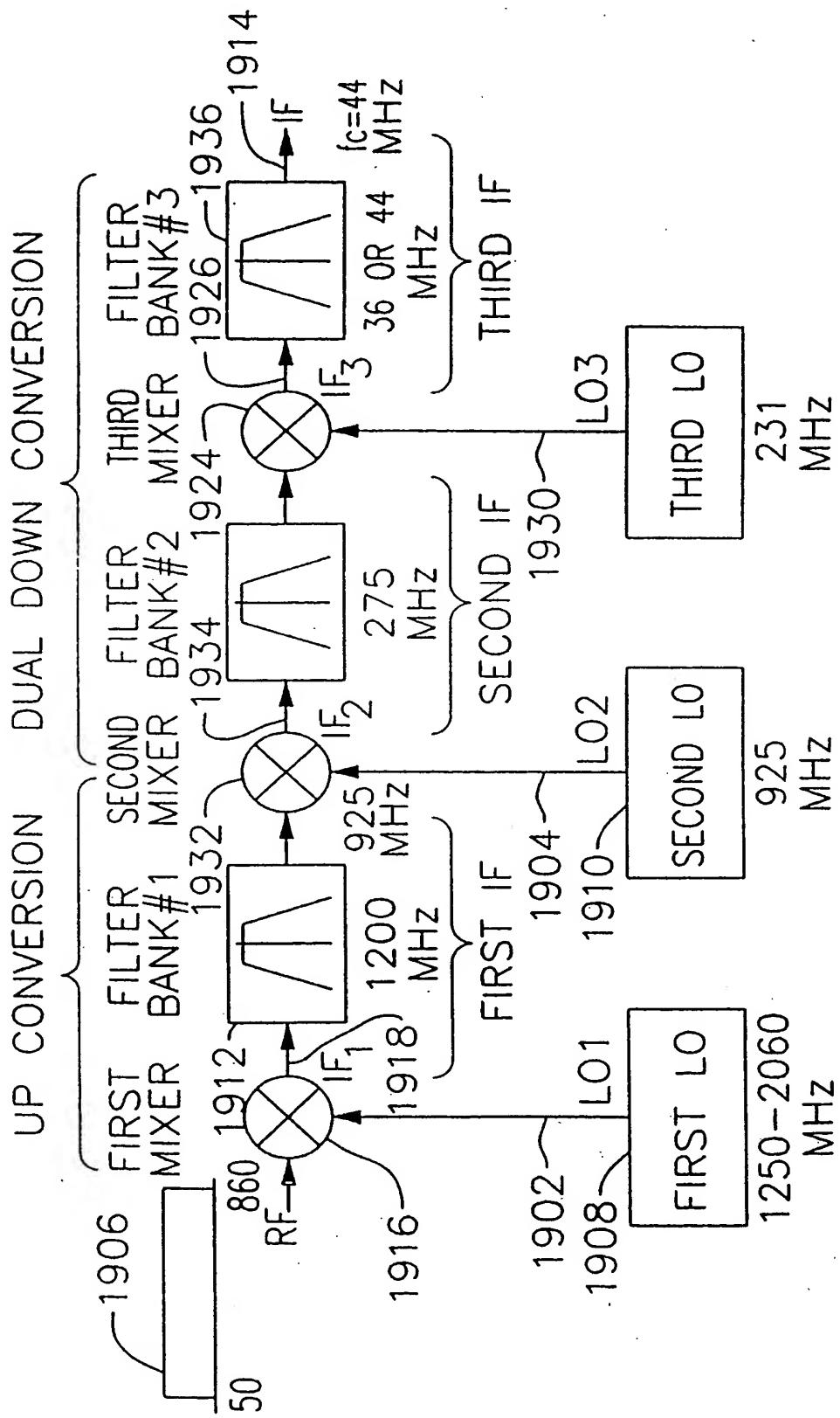


FIG. 18



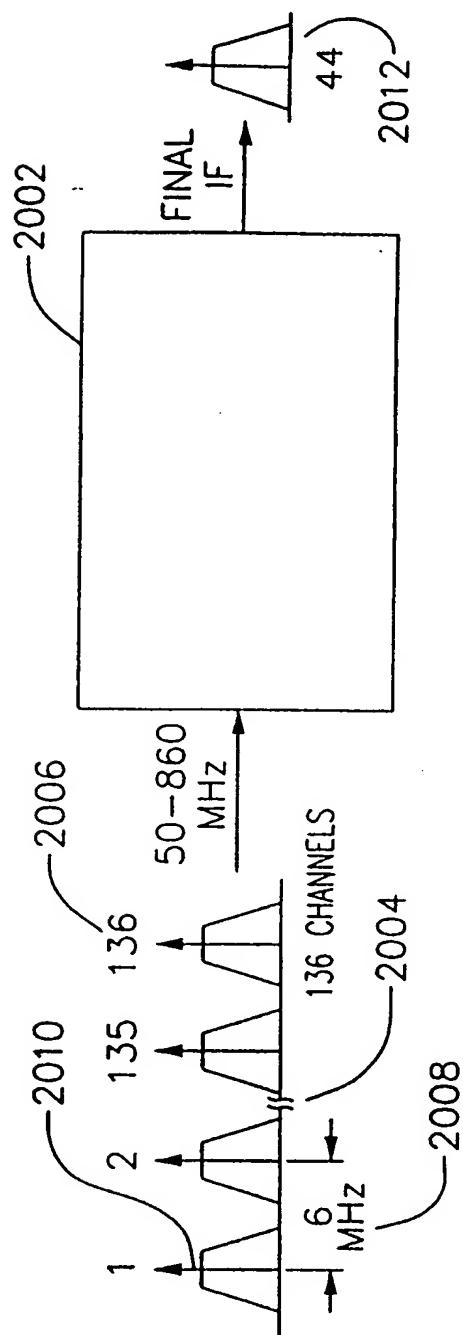
Appl. No. To Be Assigned; Filed: Herewith
 Dkt. No. 1875.138000G; Group Art Unit: To Be Assigned
 Inventors: Arya R. Behzad; Tel.: (202) 371-2600
 Title: Large Gain Range, High Linearity, Low Noise MOS
 VGA

FIG. 19



Appl. No. *To Be Assigned*; Filed: *Herewith*
Dkt. No. 1875.138000G; Group Art Unit: *To Be Assigned*
Inventors: Arya R. Behzad; Tel.: (202) 371-2600
Title: Large Gain Range, High Linearity, Low Noise MOS
VGA

FIG. 20



Appl. No. *To Be Assigned*; Filed: *Herewith*
 Dkt. No. 1875.138000G; Group Art Unit: *To Be Assigned*
 Inventors: Arya R. Behzad; Tel.: (202) 371-2600
 Title: Large Gain Range, High Linearity, Low Noise MOS
 VGA

FIG. 21

PPL Xtal REFERENCE=10MHz
 LO-1, 10MHz FREQUENCY STEPS
 LO-2, 100kHz FREQUENCY STEPS

44MHz IF

TABLE OF FREQUENCIES BASED ON
 COARSE/FINE PLL SOLUTION:

NOTE
 • LO-2 REF=100KHz,
 SO DIVIDE RANGE=9216 TO 9280

Fr _f (MHz)	50	56	62	68	74	80	86	92	98	104	110	116	122	128	"	854	860	
LO-1(MHz)	1250	1260	1260	1270	1270	1280	1290	1290	1300	1300	1310	1320	1320	1330	"	2050	2060	
IF-1 (MHz)	1200	1204	1198	1202	1196	1200	1204	1198	1202	1196	1200	1204	1198	1202	"	1196	1200	
LO-2(MHz)	924.8	928.0	923.2	926.4	921.6	924.8	928.0	928.0	923.2	926.4	921.6	924.8	928.0	923.2	926.4	"	921.6	924.8
IF-2(MHz)	275.2	276.0	274.8	275.6	274.4	275.2	276.0	274.8	275.6	274.4	275.2	276.0	274.8	275.6	"	274.4	275.2	
LO-3(MHz)	231.2	232	230.8	232	230	231	232	231	230	231	232	231	232	231	"	230	231	
IF-3(MHz)	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	"	44.0	44.0	

2102

Appl. No. *To Be Assigned*; Filed: *Herewith*
 Dkt. No. 1875.138000G; Group Art Unit: *To Be Assigned*
 Inventors: Arya R. Behzad; Tel.: (202) 371-2600
 Title: Large Gain Range, High Linearity, Low Noise MOS
 VGA

FIG. 22

PPL Xtal REFERENCE=10MHz
 LO-1. 10MHz FREQUENCY STEPS
 LO-2. 100kHz FREQUENCY STEPS
 36MHz IF

TABLE OF FREQUENCIES BASED ON
COARSE/FINE PLL SOLUTION:

Fr1 (MHz)	NOTE • LO-2 REF=100kHz, SO DIVIDE RANGE=9280 TO 9340												860				
	50	58	66	74	82	90	98	106	114	122	130	138	146	154	"	852	
LO-1(MHz)	1250	1260	1270	1270	1280	1290	1300	1310	1310	1320	1330	1340	1350	1350	"	2050	2060
IF-1 (MHz)	1200	1202	1204	1196	1198	1200	1202	1204	1196	1198	1200	1202	1204	1196	"	1198	1200
LO-2(MHz)	931.2	932.8	934.4	928.0	930	931	933	934	928.0	930	931	933	934	928.0	"	929.60	931.2
IF-2(MHz)	268.8	269.2	269.6	268.0	268.4	268.8	269.2	269.6	268.0	268.4	268.8	269.2	269.6	268.0	"	268.4	268.8
LO-3(MHz)	232.8	233.2	233.6	232	233	233	234	232	232	233	233	234	232.0	"	232.4	232.8	
IF-3(MHz)	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	"	36.0	36.0	

FIG. 23

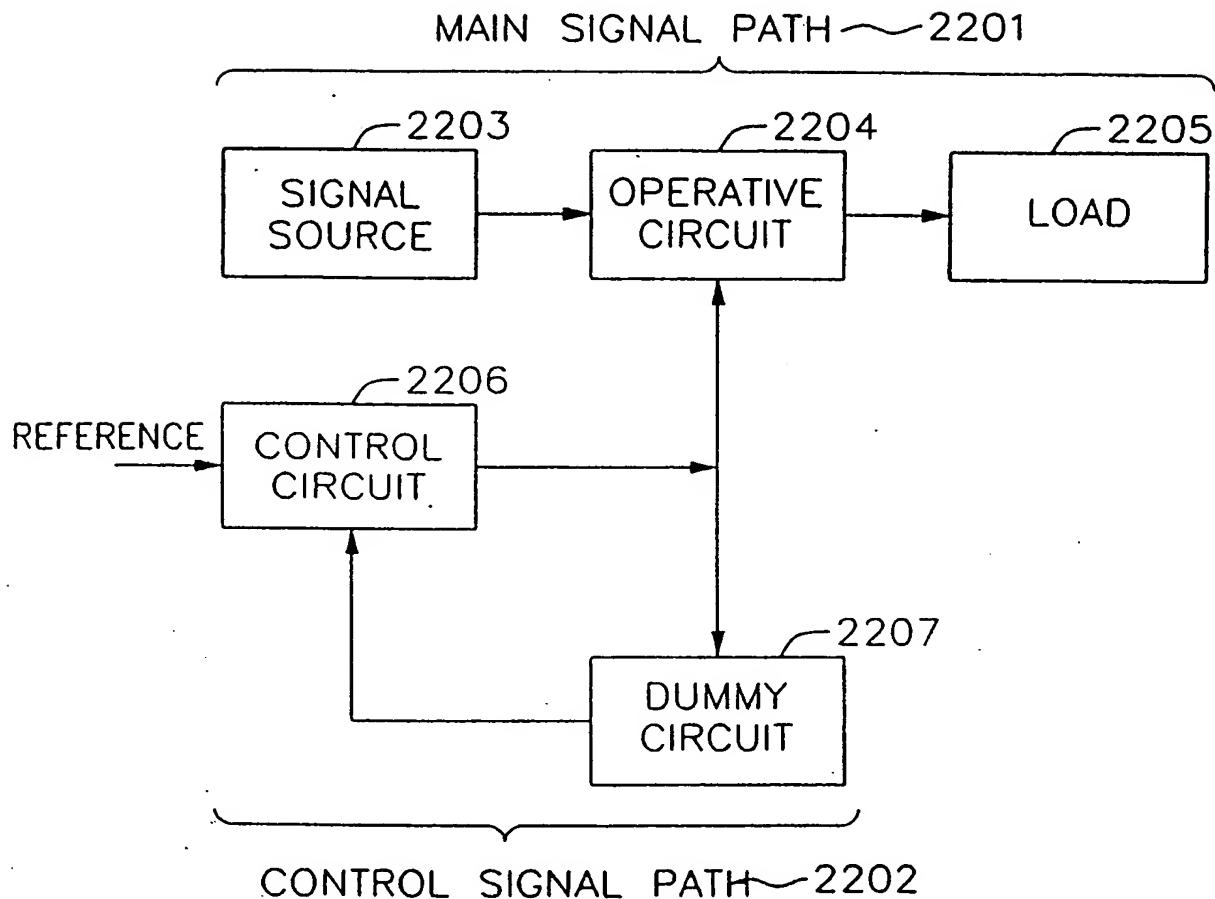


FIG. 24a

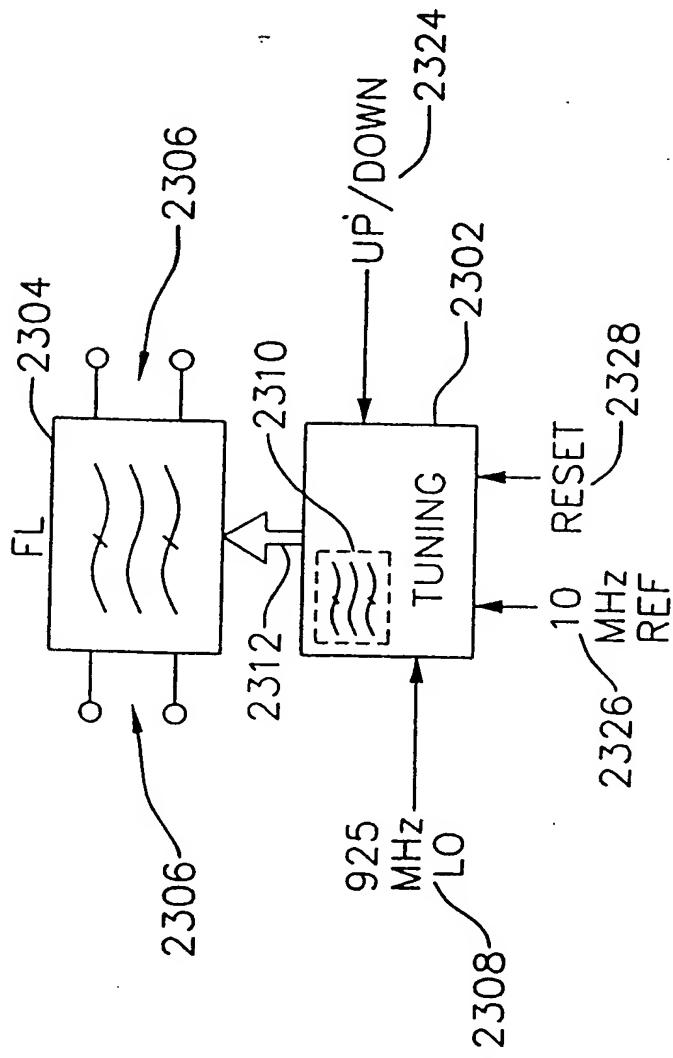
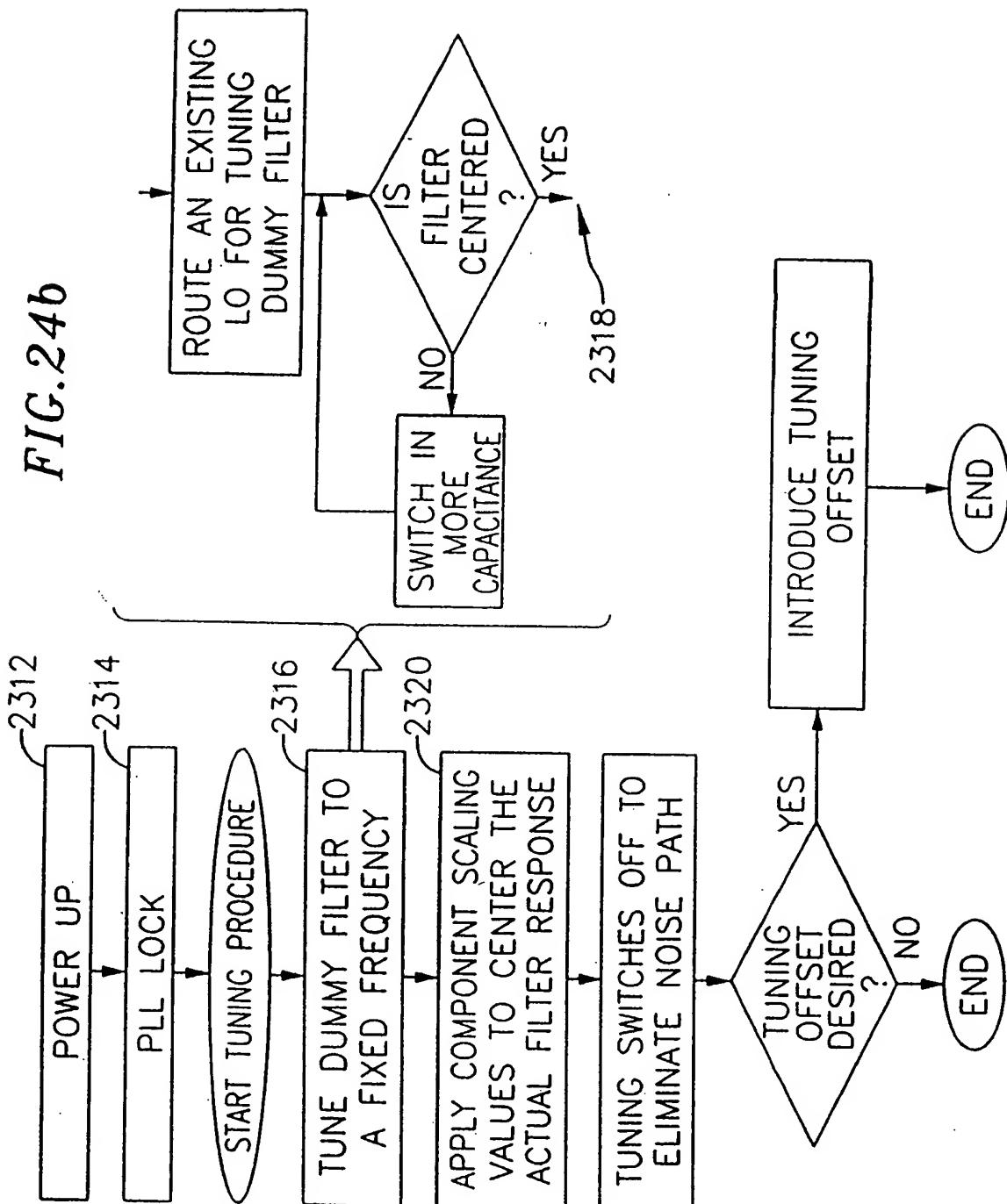
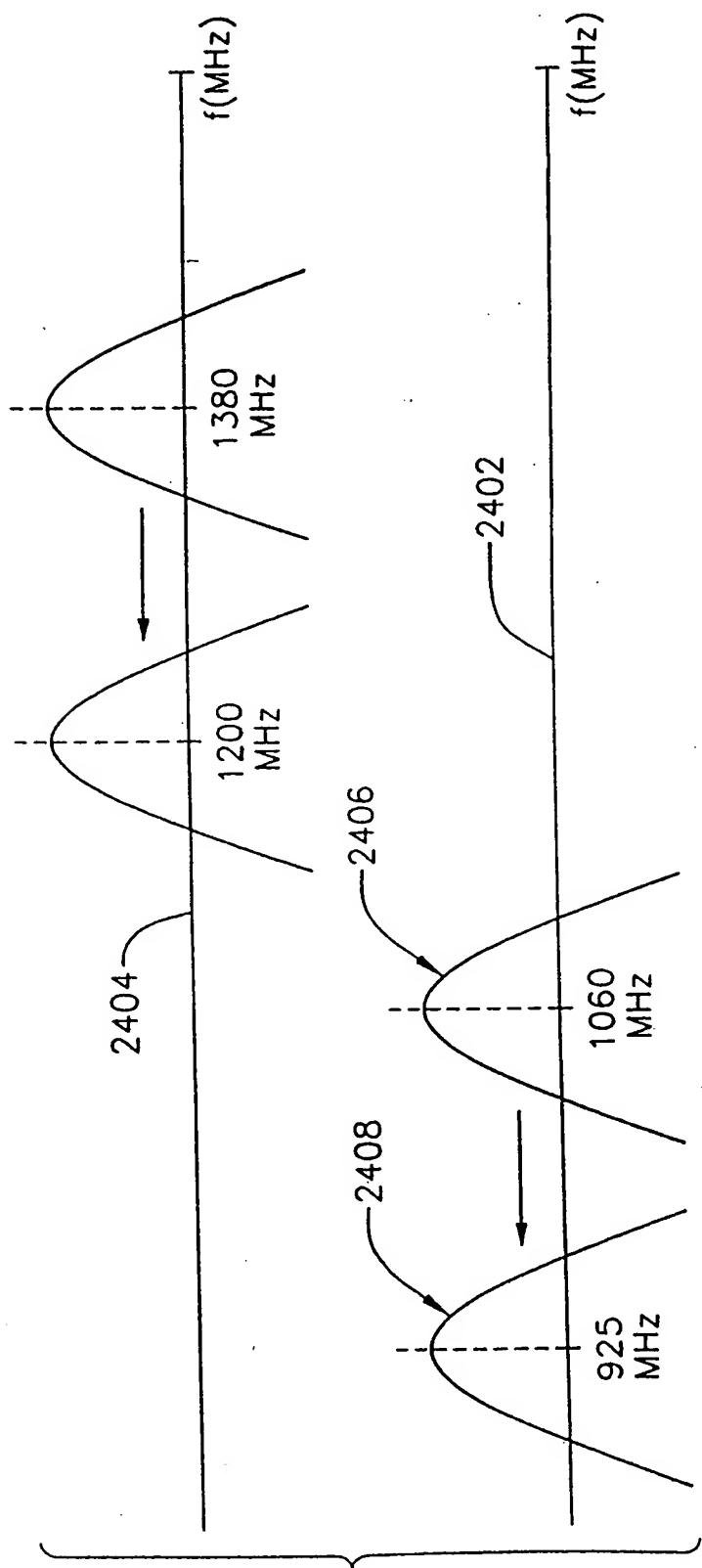


FIG. 24b



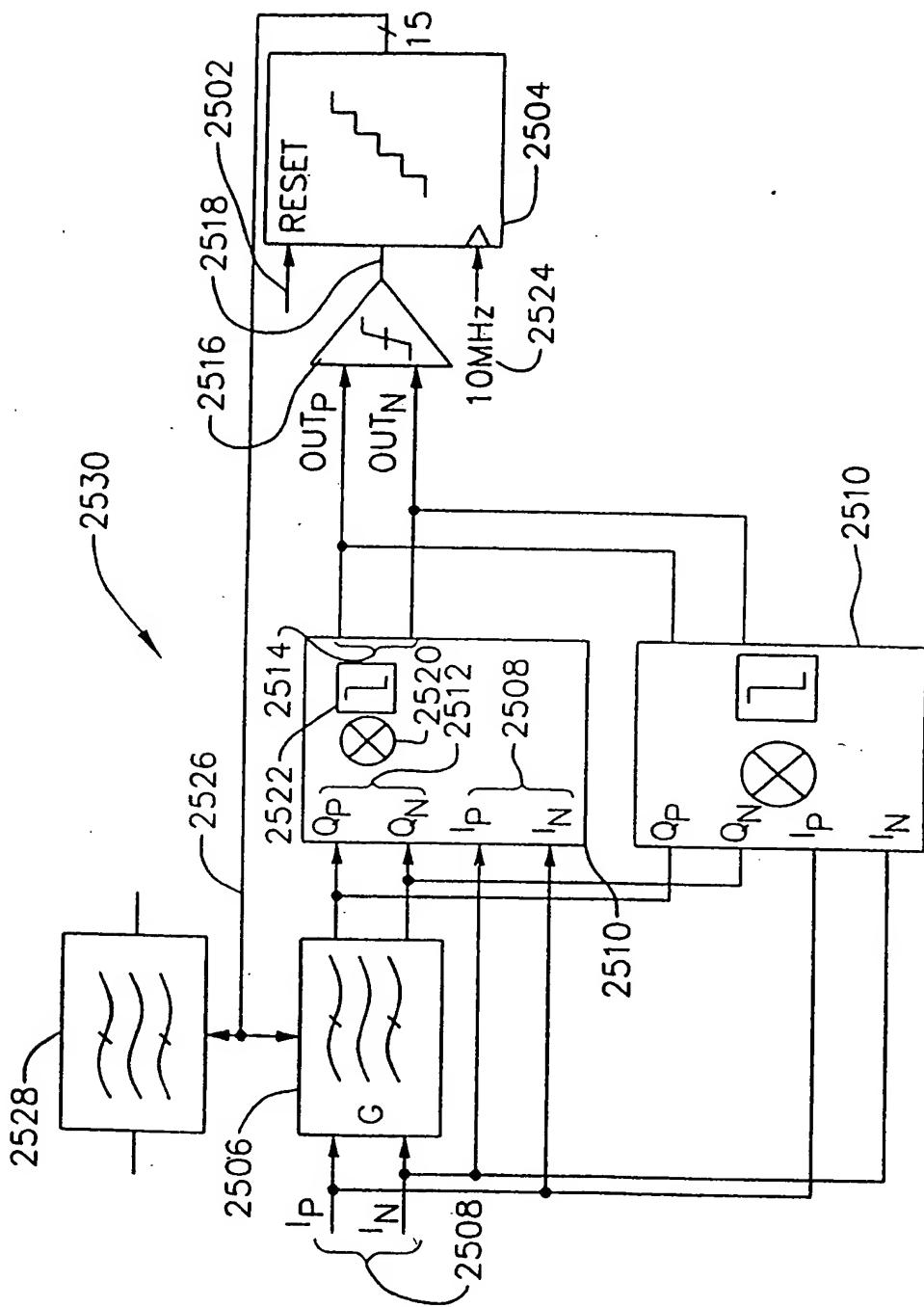
Appl. No. *To Be Assigned*; Filed: *Herewith*
Dkt. No. 1875.138000G; Group Art Unit: *To Be Assigned*
Inventors: Arya R. Behzad; Tel.: (202) 371-2600
Title: Large Gain Range, High Linearity, Low Noise MOS
VGA

FIG. 24C



Appl. No. *To Be Assigned*; Filed: *Herewith*
Dkt. No. 1875.138000G; Group Art Unit: *To Be Assigned*
Inventors: Arya R. Behzad; Tel.: (202) 371-2600
Title: Large Gain Range, High Linearity, Low Noise MOS
VGA

FIG. 25



Appl. No. *To Be Assigned*; Filed: *Herewith*
Dkt. No. 1875.138000G; Group Art Unit: *To Be Assigned*
Inventors: Arya R. Behzad; Tel.: (202) 371-2600
Title: Large Gain Range, High Linearity, Low Noise MOS
VGA

FIG. 26

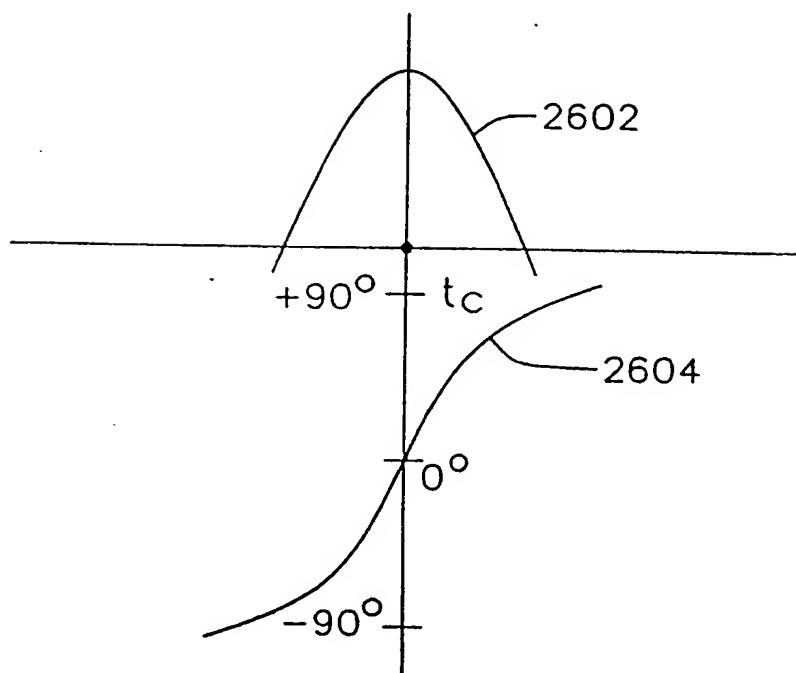


FIG. 27

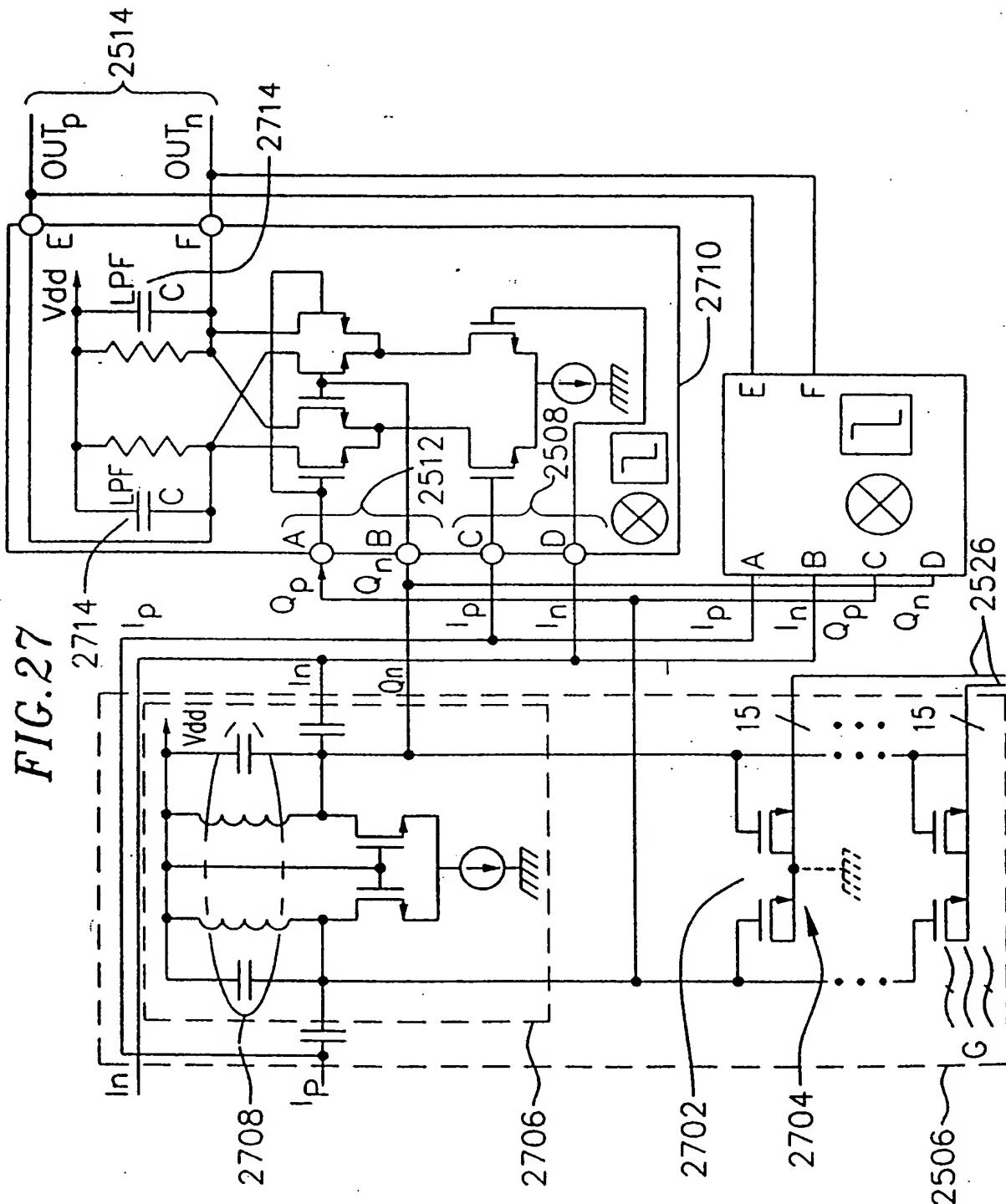
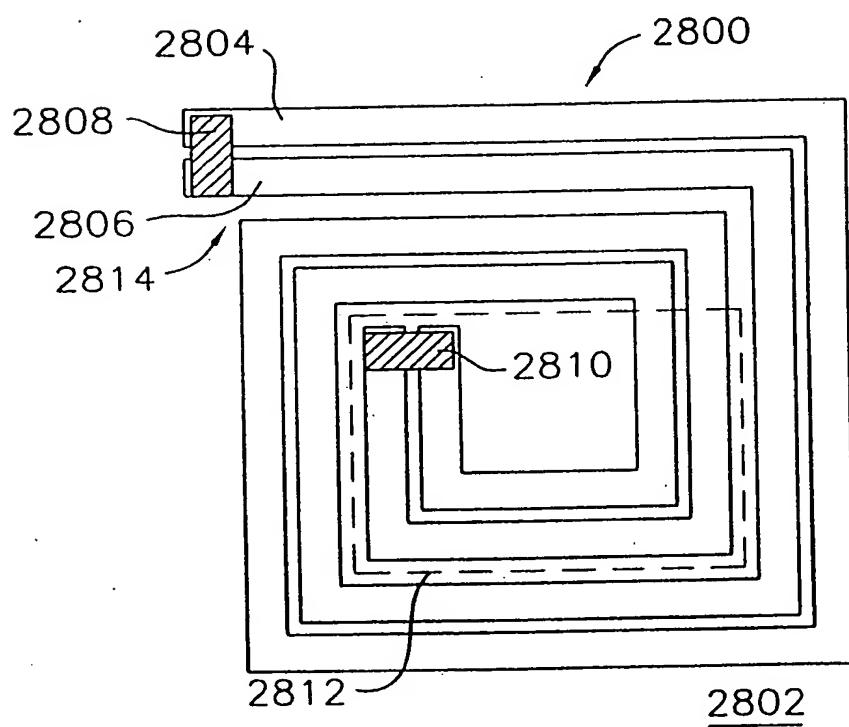


FIG. 28a



Appl. No. *To Be Assigned*; Filed: *Herewith*
Dkt. No. 1875.138000G; Group Art Unit: *To Be Assigned*
Inventors: Arya R. Behzad; Tel.: (202) 371-2600
Title: Large Gain Range, High Linearity, Low Noise MOS
VGA

FIG. 28b

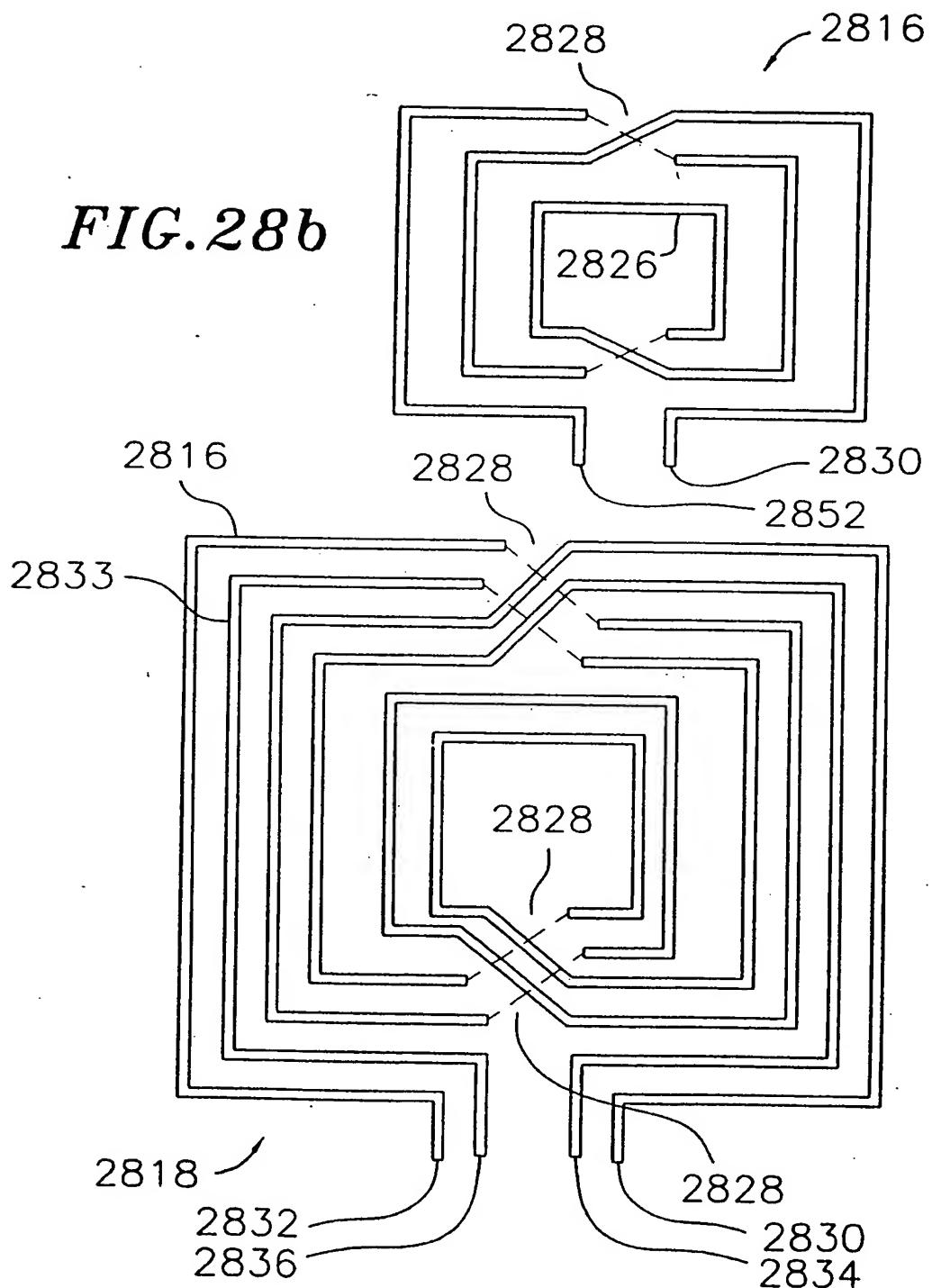
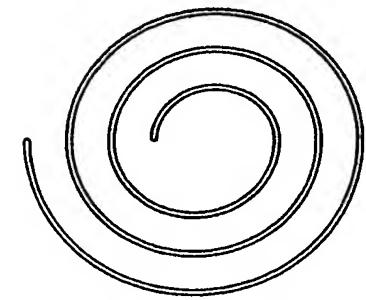
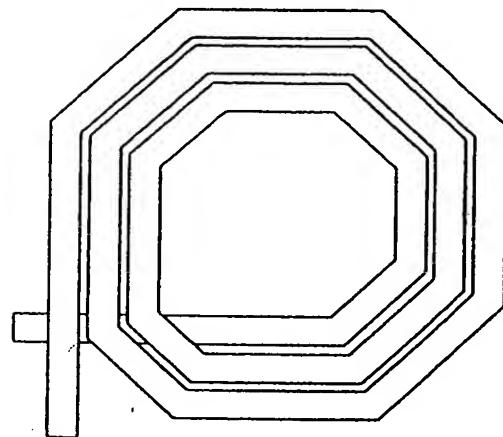


FIG. 28e



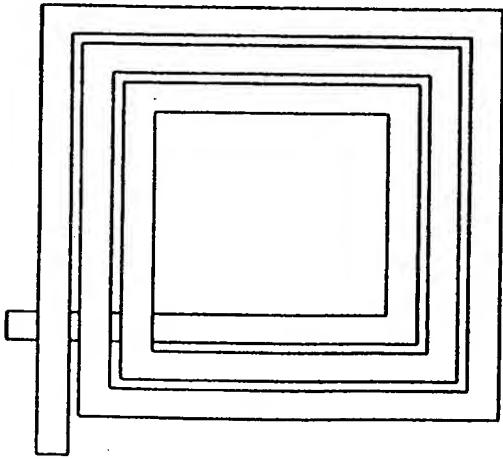
2824

FIG. 28d



2822

FIG. 28c



2820

Appl. No. *To Be Assigned*; Filed: *Herewith*
Dkt. No. 1875.138000G; Group Art Unit: *To Be Assigned*
Inventors: Arya R. Behzad; Tel.: (202) 371-2600
Title: Large Gain Range, High Linearity, Low Noise MOS
VGA

FIG. 28f

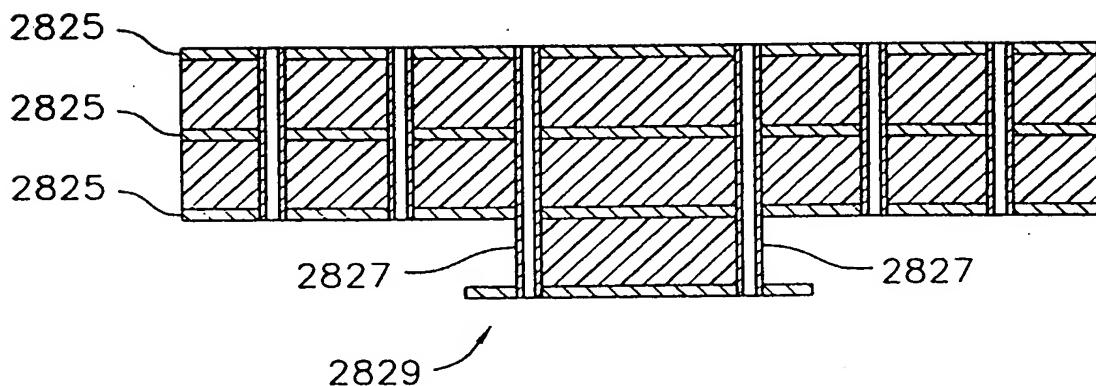
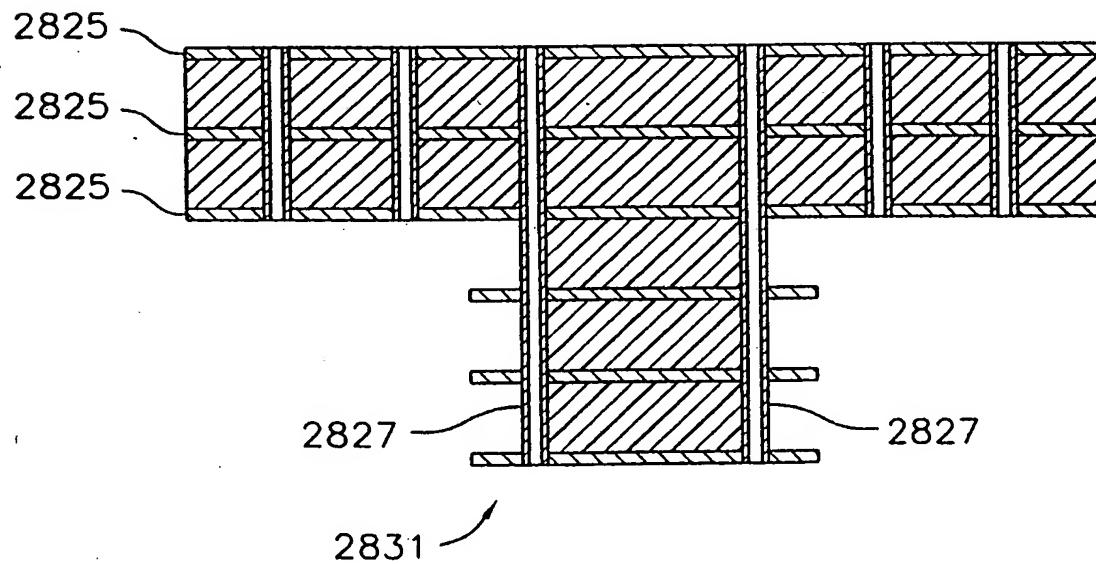
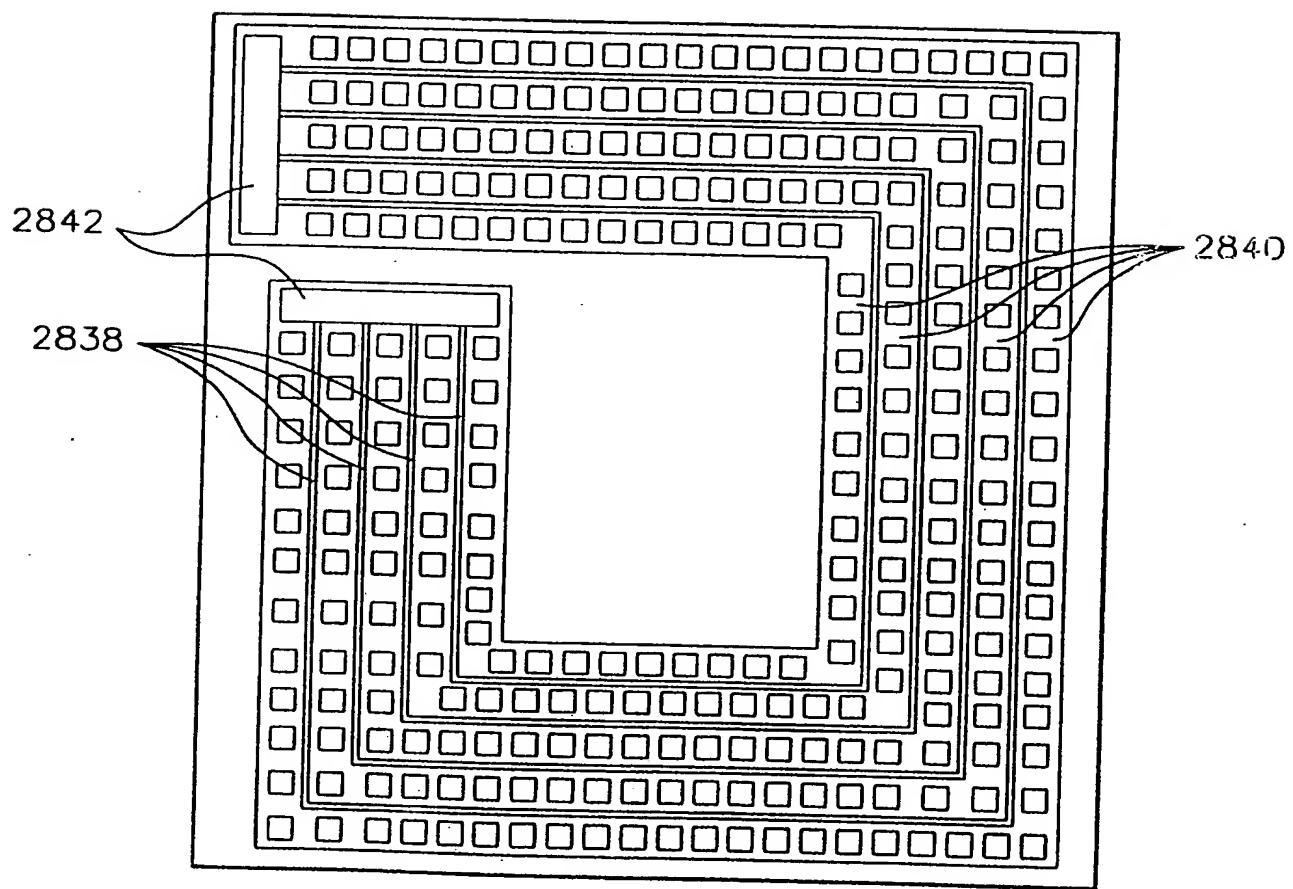


FIG. 28g

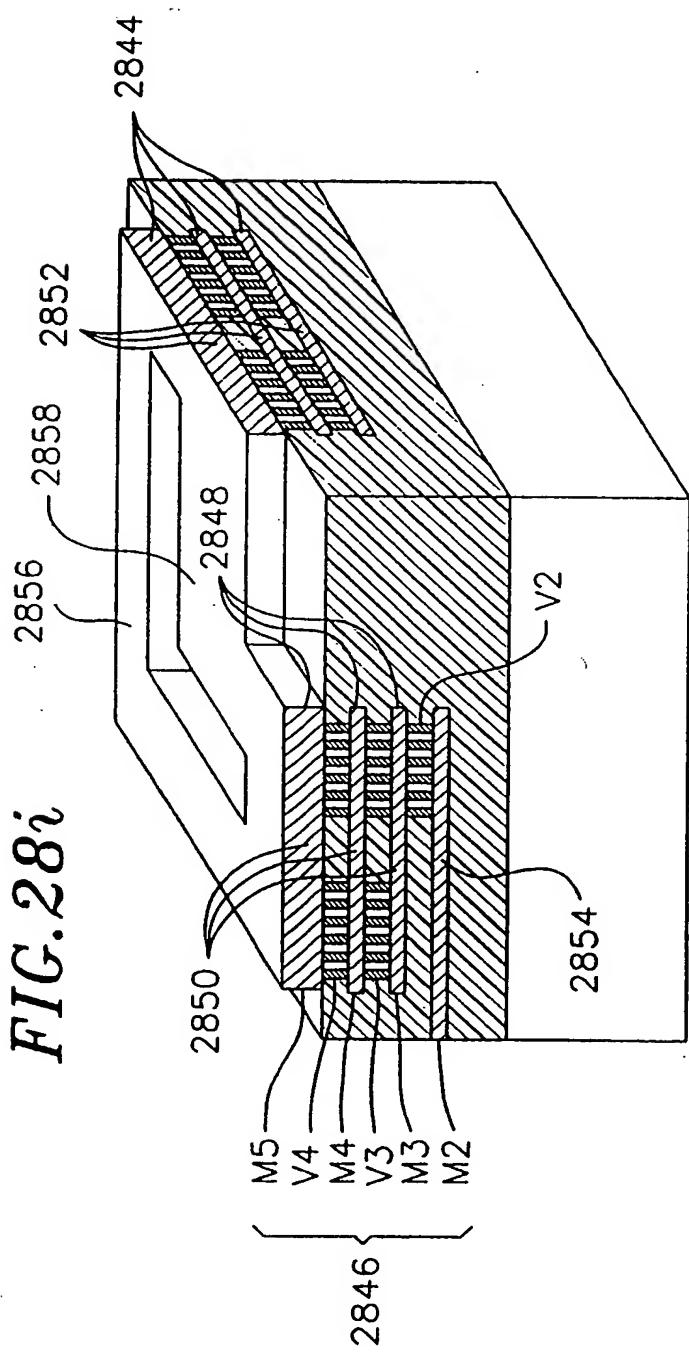


Appl. No. *To Be Assigned*; Filed: *Herewith*
Dkt. No. 1875.138000G; Group Art Unit: *To Be Assigned*
Inventors: Arya R. Behzad; Tel.: (202) 371-2600
Title: Large Gain Range, High Linearity, Low Noise MOS
VGA

FIG. 28h

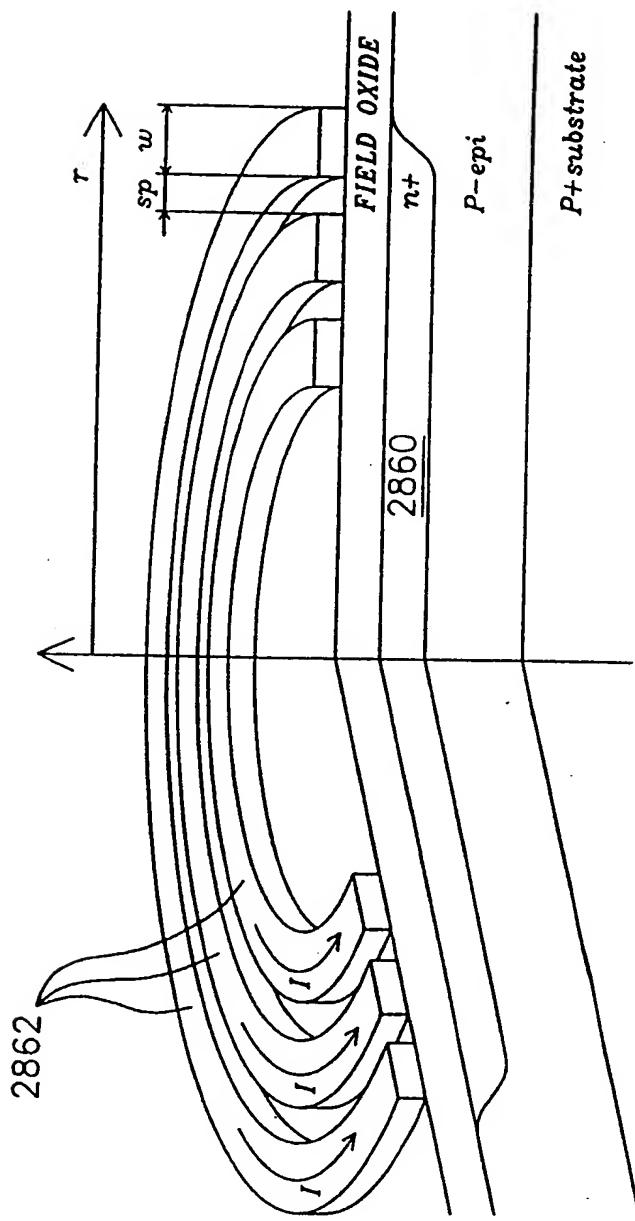


Appl. No. *To Be Assigned*; Filed: *Herewith*
Dkt. No. 1875.138000G; Group Art Unit: *To Be Assigned*
Inventors: Arya R. Behzad; Tel.: (202) 371-2600
Title: Large Gain Range, High Linearity, Low Noise MOS
VGA



Appl. No. *To Be Assigned*; Filed: *Herewith*
Dkt. No. 1875.138000G; Group Art Unit: *To Be Assigned*
Inventors: Arya R. Behzad; Tel.: (202) 371-2600
Title: Large Gain Range, High Linearity, Low Noise MOS
VGA

FIG. 28j



Appl. No. *To Be Assigned*; Filed: *Herewith*
Dkt. No. 1875.138000G; Group Art Unit: *To Be Assigned*
Inventors: Arya R. Behzad; Tel.: (202) 371-2600
Title: Large Gain Range, High Linearity, Low Noise MOS
VGA

FIG. 28k

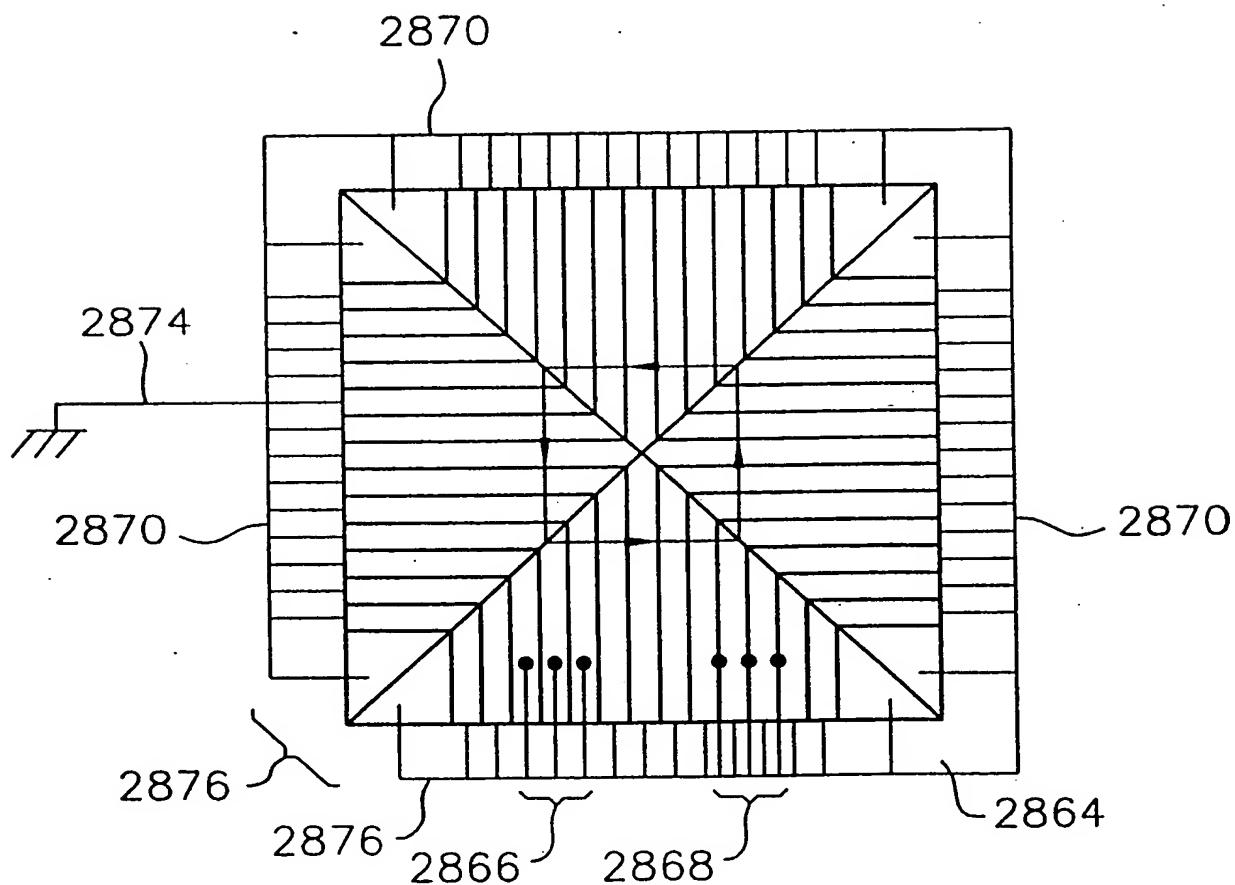
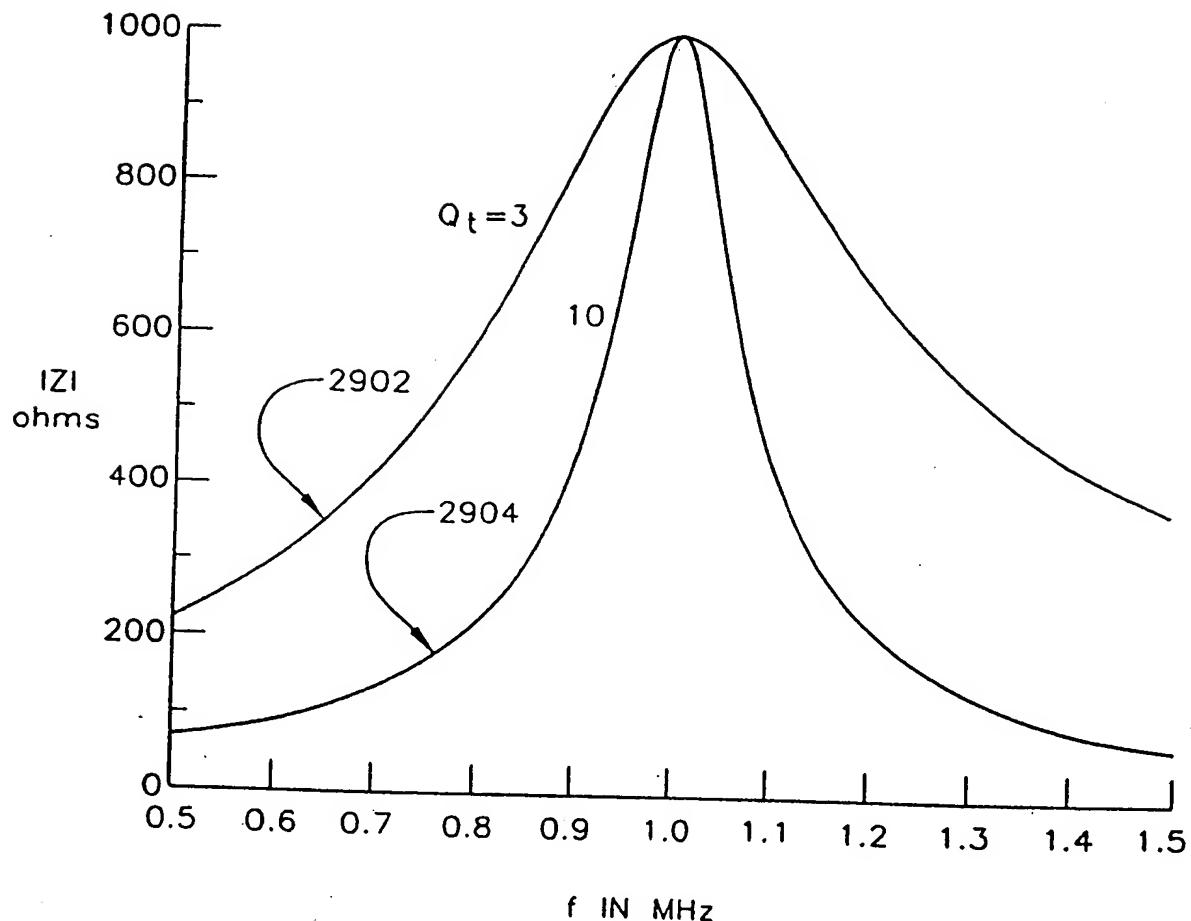


FIG. 29



Appl. No. To Be Assigned; Filed: Herewith
 Dkt. No. 1875.138000G; Group Art Unit: To Be Assigned
 Inventors: Arya R. Behzad; Tel.: (202) 371-2600
 Title: Large Gain Range, High Linearity, Low Noise MOS
 VGA

FIG. 30

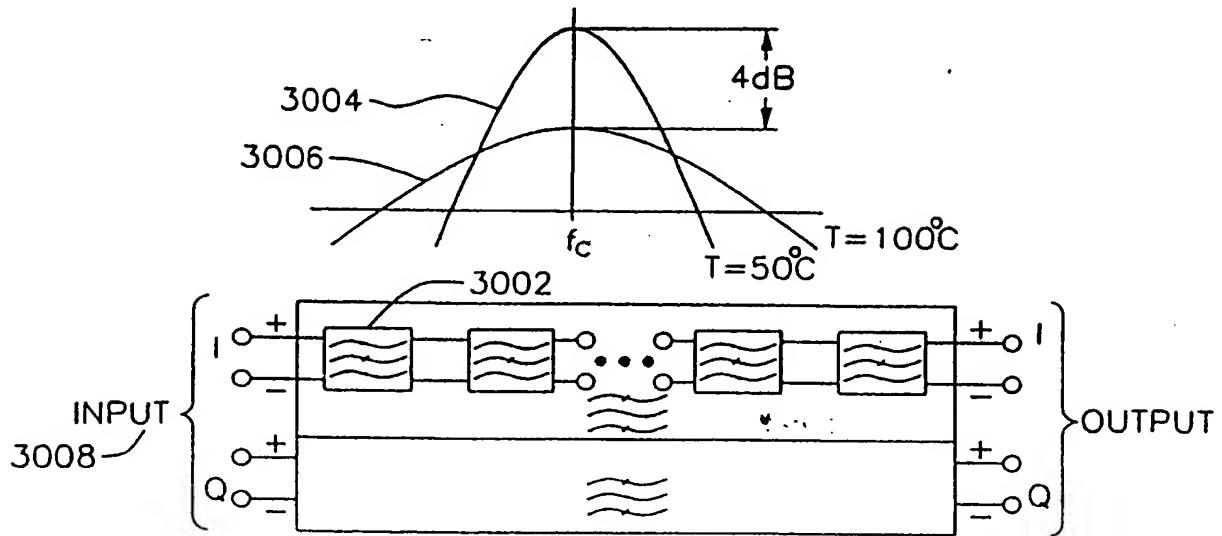


FIG. 31

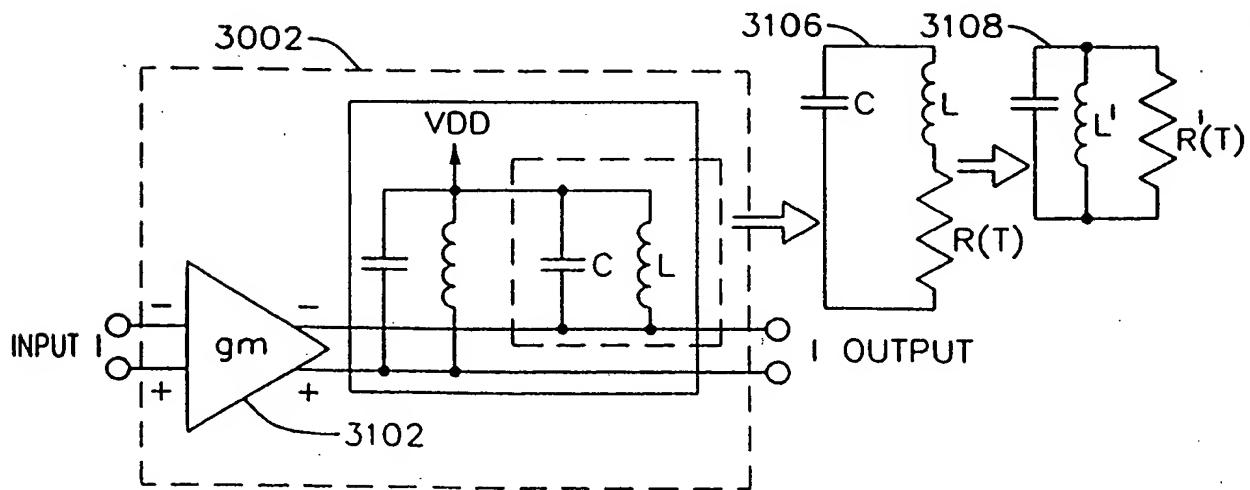


FIG. 32

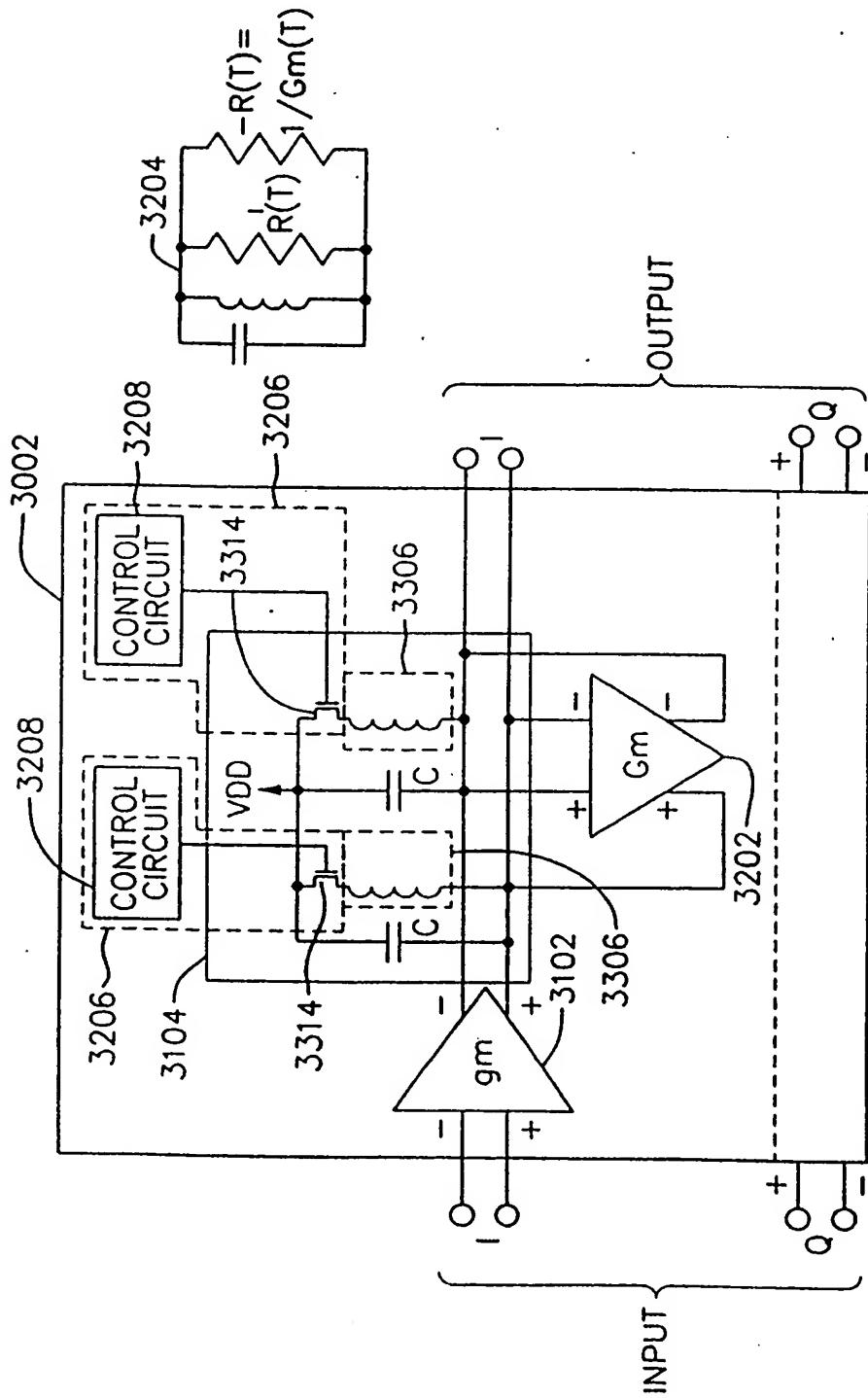
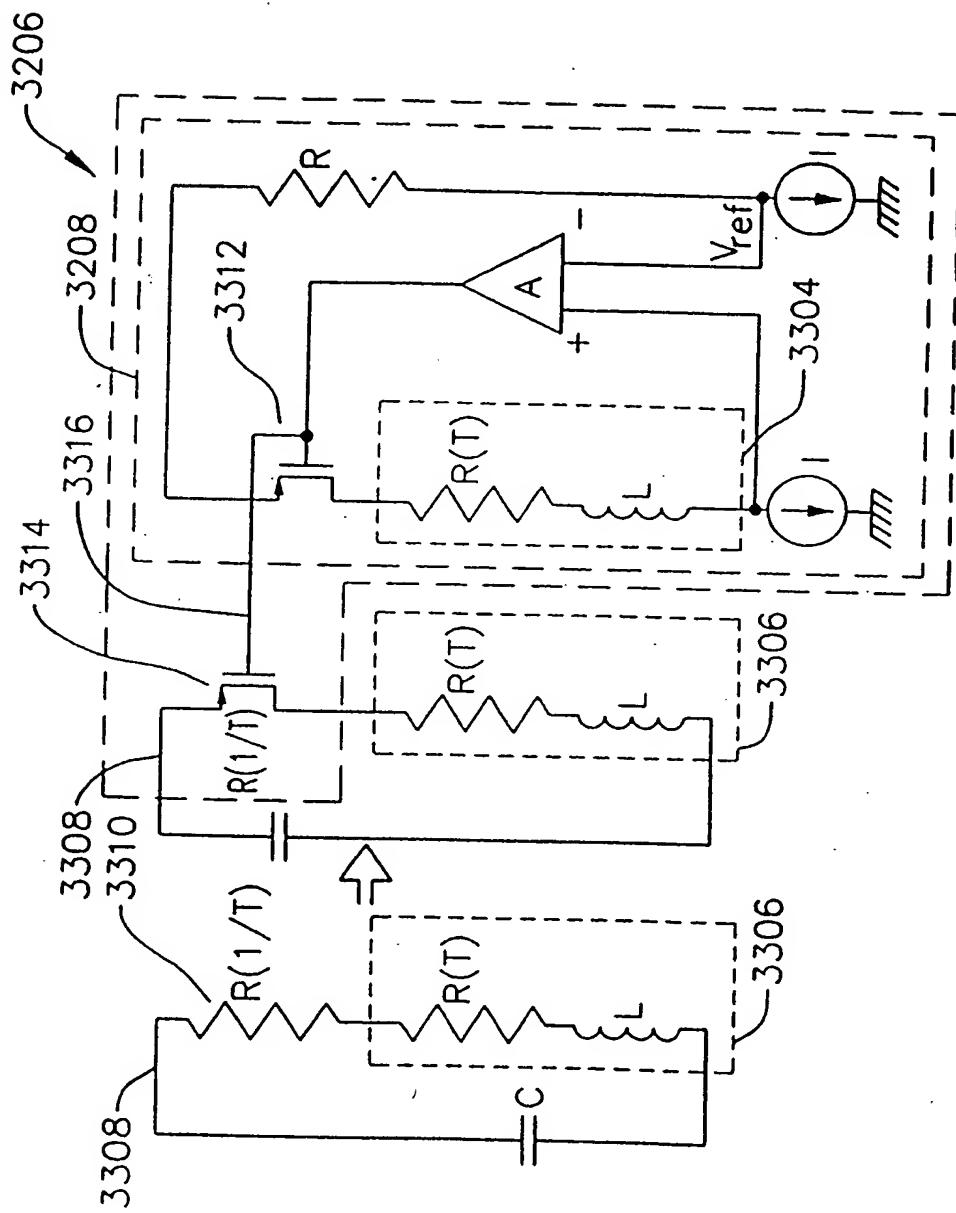


FIG. 33



Appl. No. *To Be Assigned*; Filed: *Herewith*
 Dkt. No. 1875.138000G; Group Art Unit: *To Be Assigned*
 Inventors: Arya R. Behzad; Tel.: (202) 371-2600
 Title: Large Gain Range, High Linearity, Low Noise MOS
 VGA

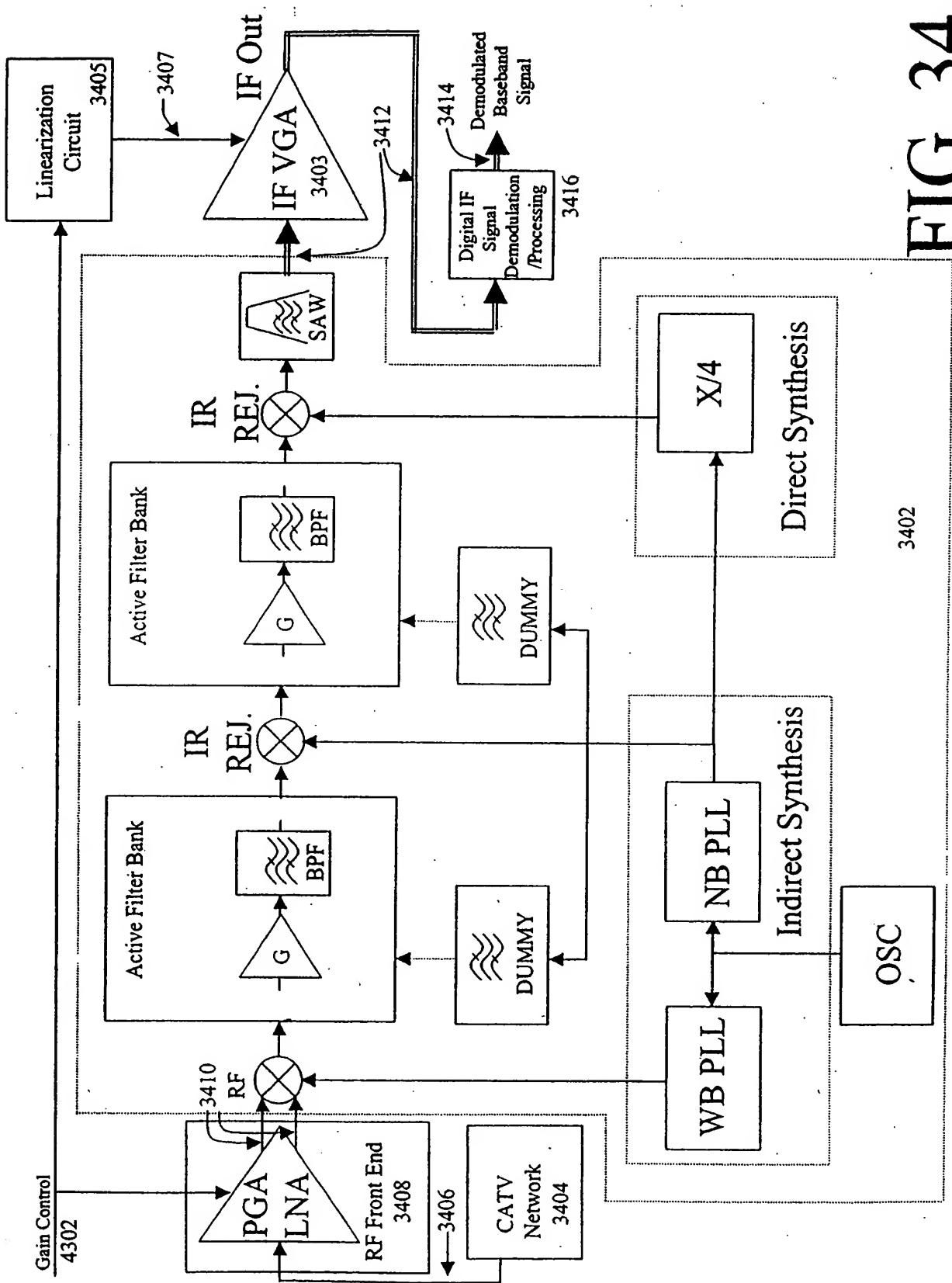
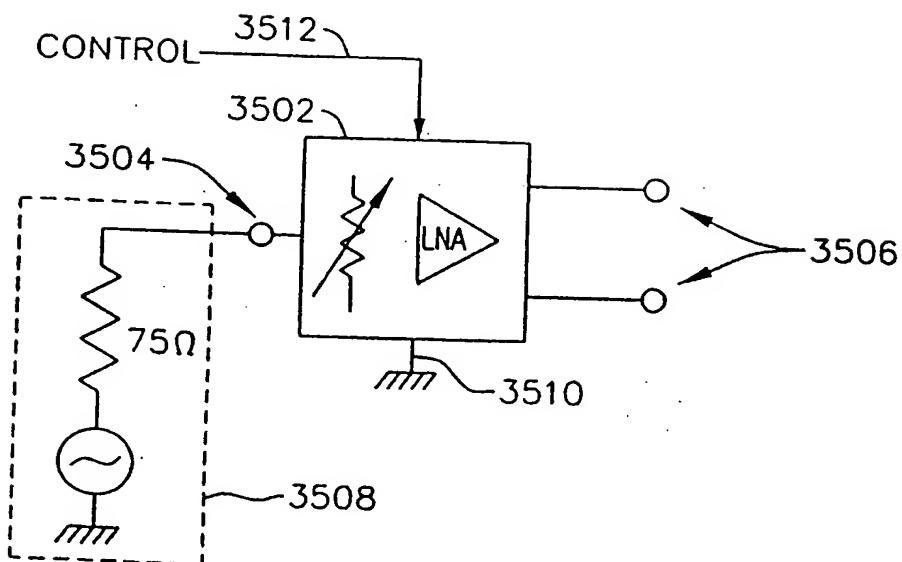


FIG. 34

3402

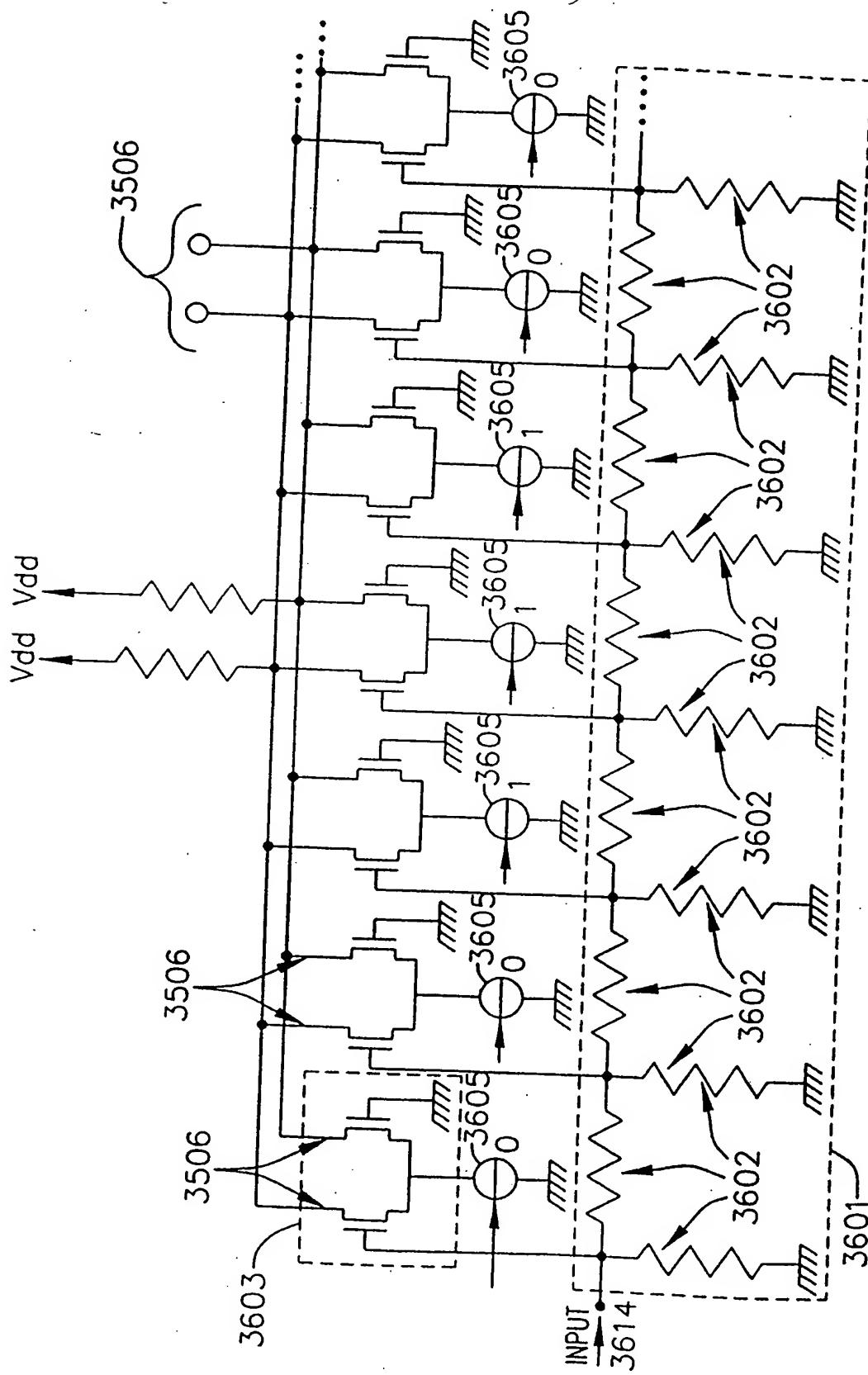
Appl. No. *To Be Assigned*; Filed: *Herewith*
Dkt. No. 1875.138000G; Group Art Unit: *To Be Assigned*
Inventors: Arya R. Behzad; Tel.: (202) 371-2600
Title: Large Gain Range, High Linearity, Low Noise MOS
VGA

FIG. 35



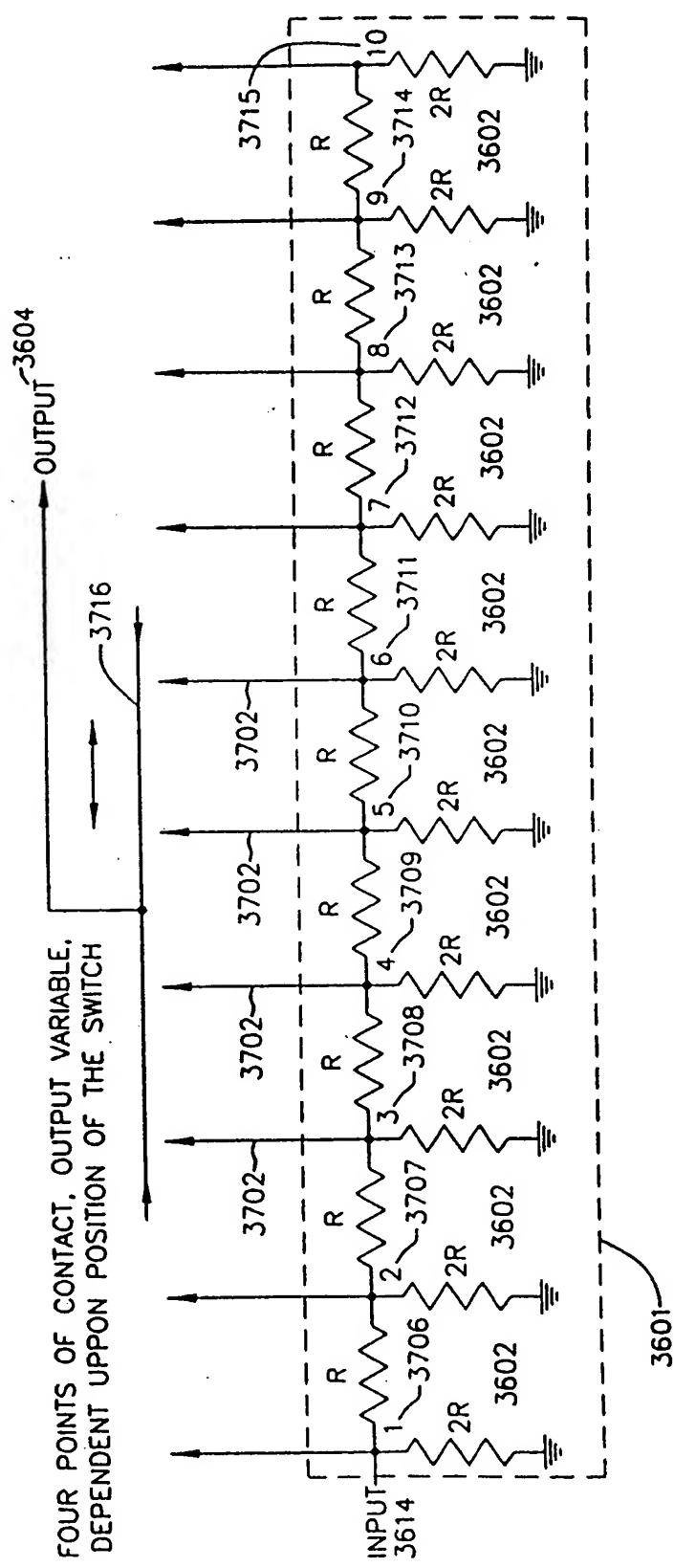
Appl. No. *To Be Assigned*; Filed: *Herewith*
Dkt. No. 1875.138000G; Group Art Unit: *To Be Assigned*
Inventors: Arya R. Belizad; Tel.: (202) 371-2600
Title: Large Gain Range, High Linearity, Low Noise MOS
VGA

FIG. 36



Appl. No. *To Be Assigned*; Filed: *Herewith*
 Dkt. No. 1875.138000G; Group Art Unit: *To Be Assigned*
 Inventors: Arya R. Behzad; Tel.: (202) 371-2600
 Title: Large Gain Range, High Linearity, Low Noise MOS
 VGA

FIG. 37



Appl. No. *To Be Assigned*; Filed: *Herewith*
 Dkt. No. 1875.138000G; Group Art Unit: *To Be Assigned*
 Inventors: Arya R. Behzad; Tel.: (202) 371-2600
 Title: Large Gain Range, High Linearity, Low Noise MOS
 VGA

FIG. 38

PGA SETTINGS

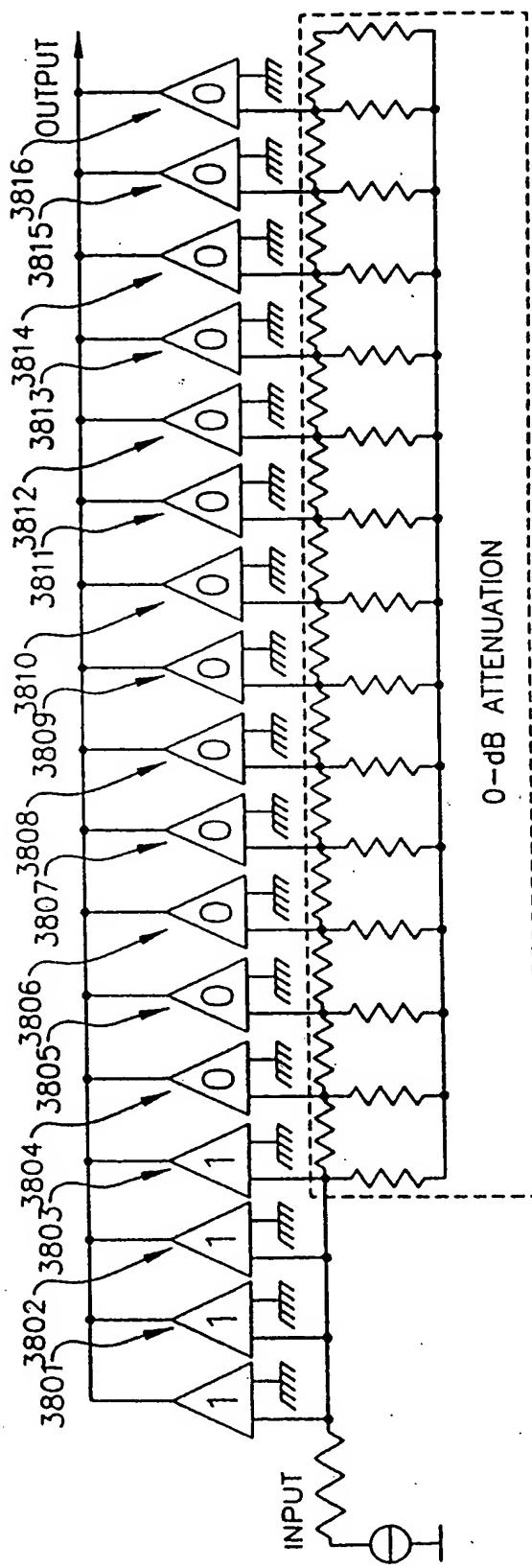


FIG. 39

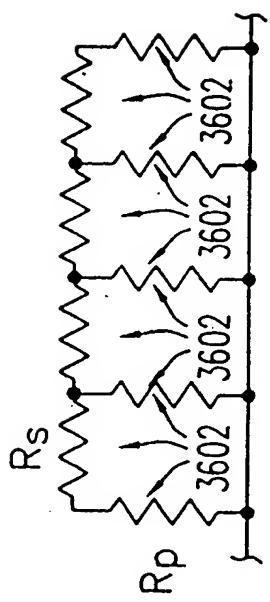
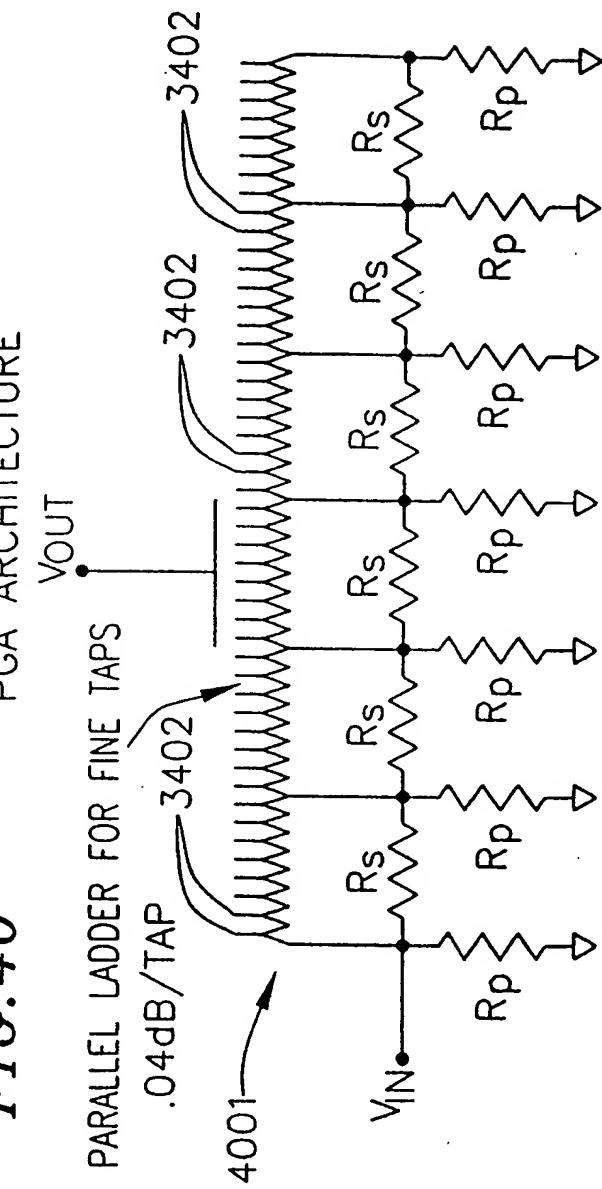
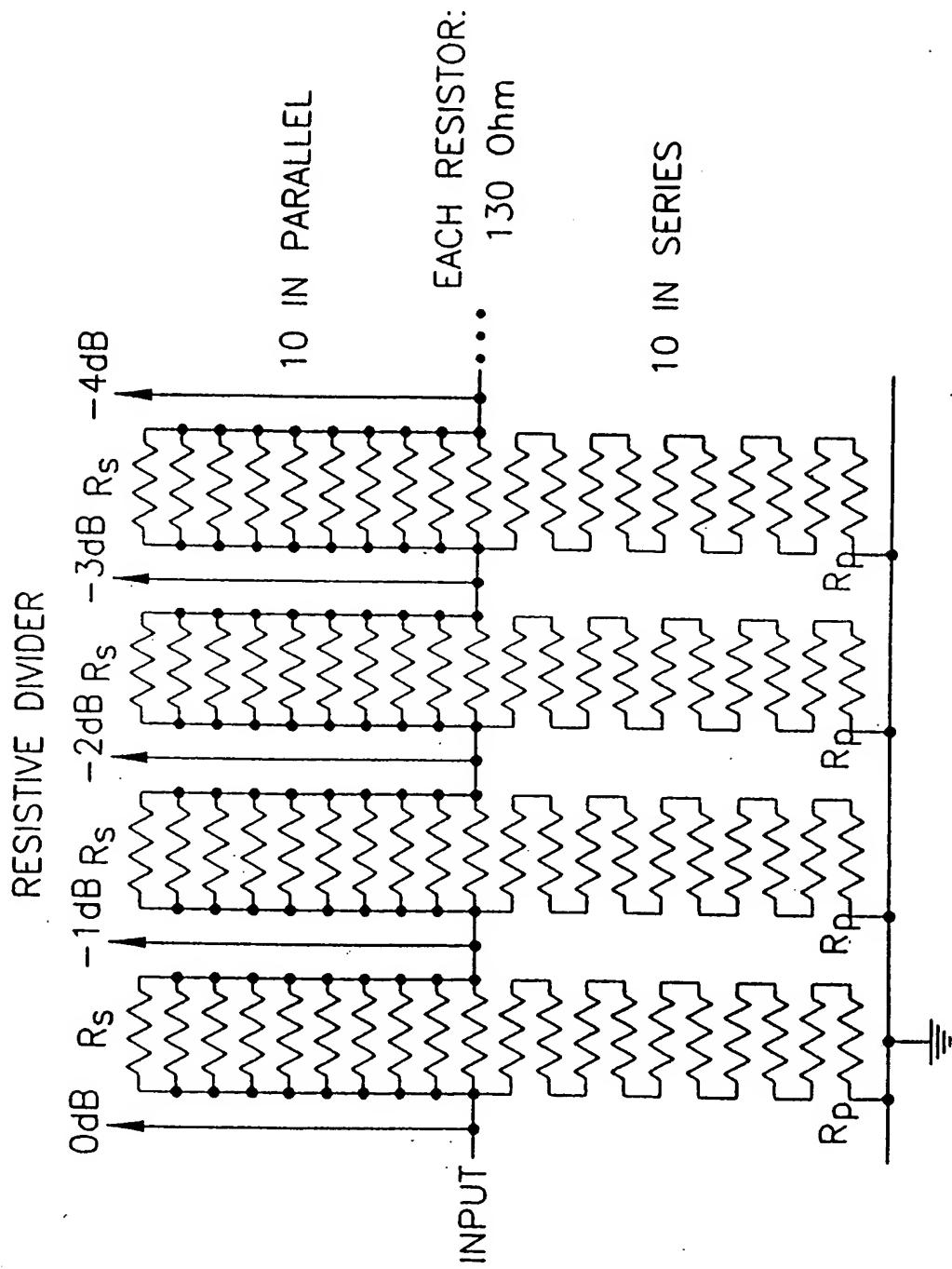


FIG. 40



Appl. No. *To Be Assigned*; Filed: *Herewith*
Dkt. No. 1875.138000G; Group Art Unit: *To Be Assigned*
Inventors: Arya R. Behzad; Tel.: (202) 371-2600
Title: Large Gain Range, High Linearity, Low Noise MOS
VGA

FIG. 41



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Dkt. No. 1875.138000G; Group Art Unit: *To Be Assigned*
Inventors: Arya R. Behzad; Tel.: (202) 371-2600
Title: Large Gain Range, High Linearity, Low Noise MOS
VGA

FIG. 42
NON-MONOTONICITY

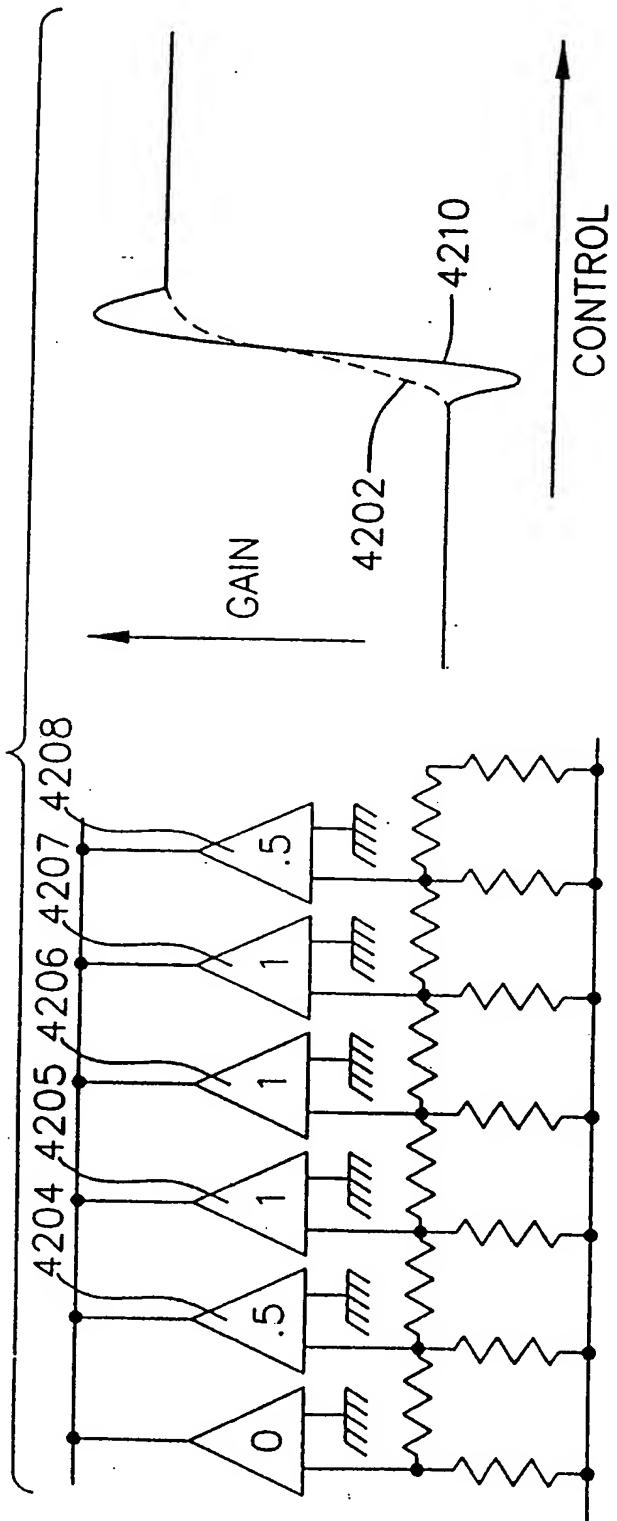
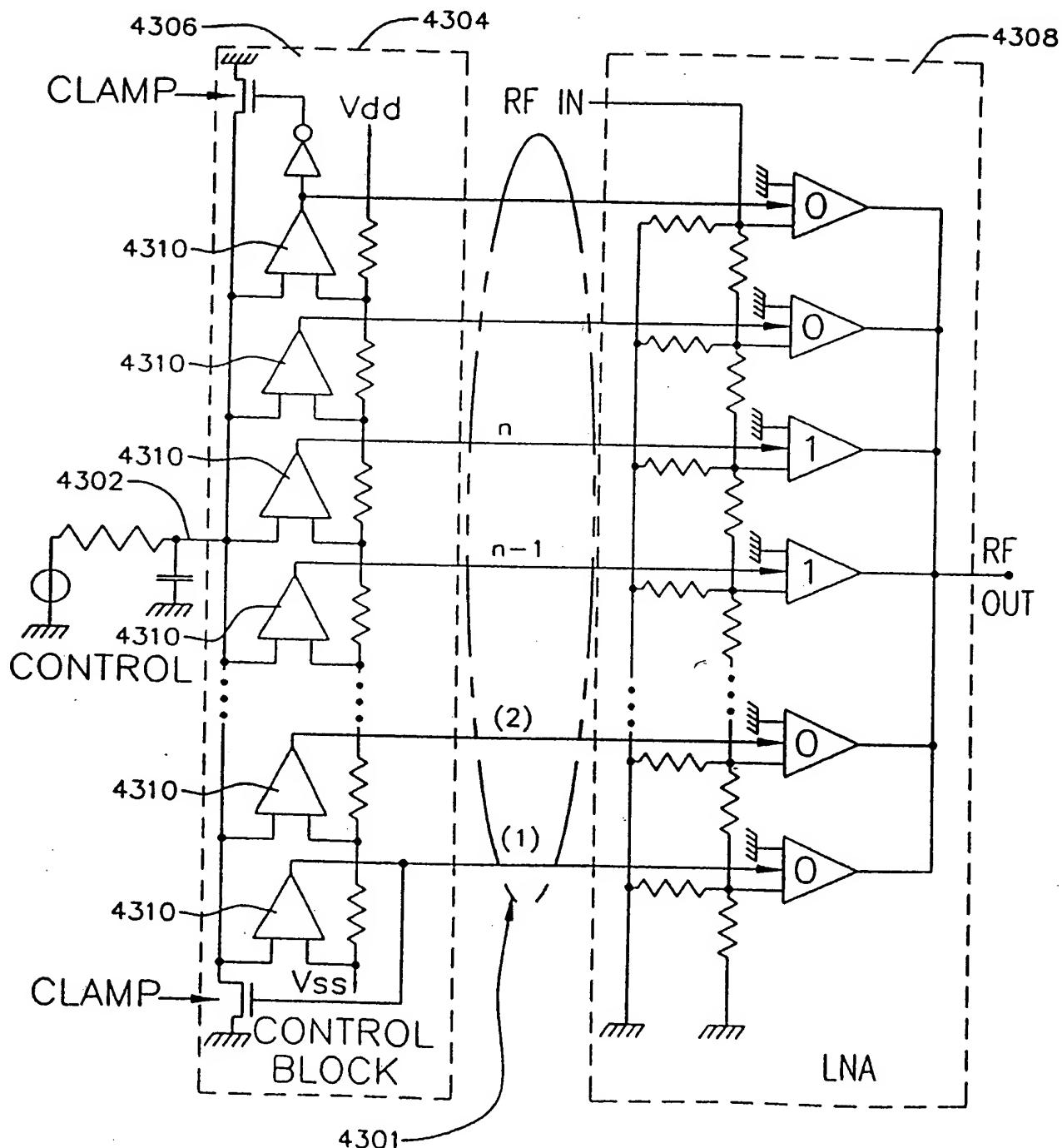


FIG. 43
CLAMPING CONTROL RANGE



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FIG. 44a
CONTROLLED GAIN COMPARATOR

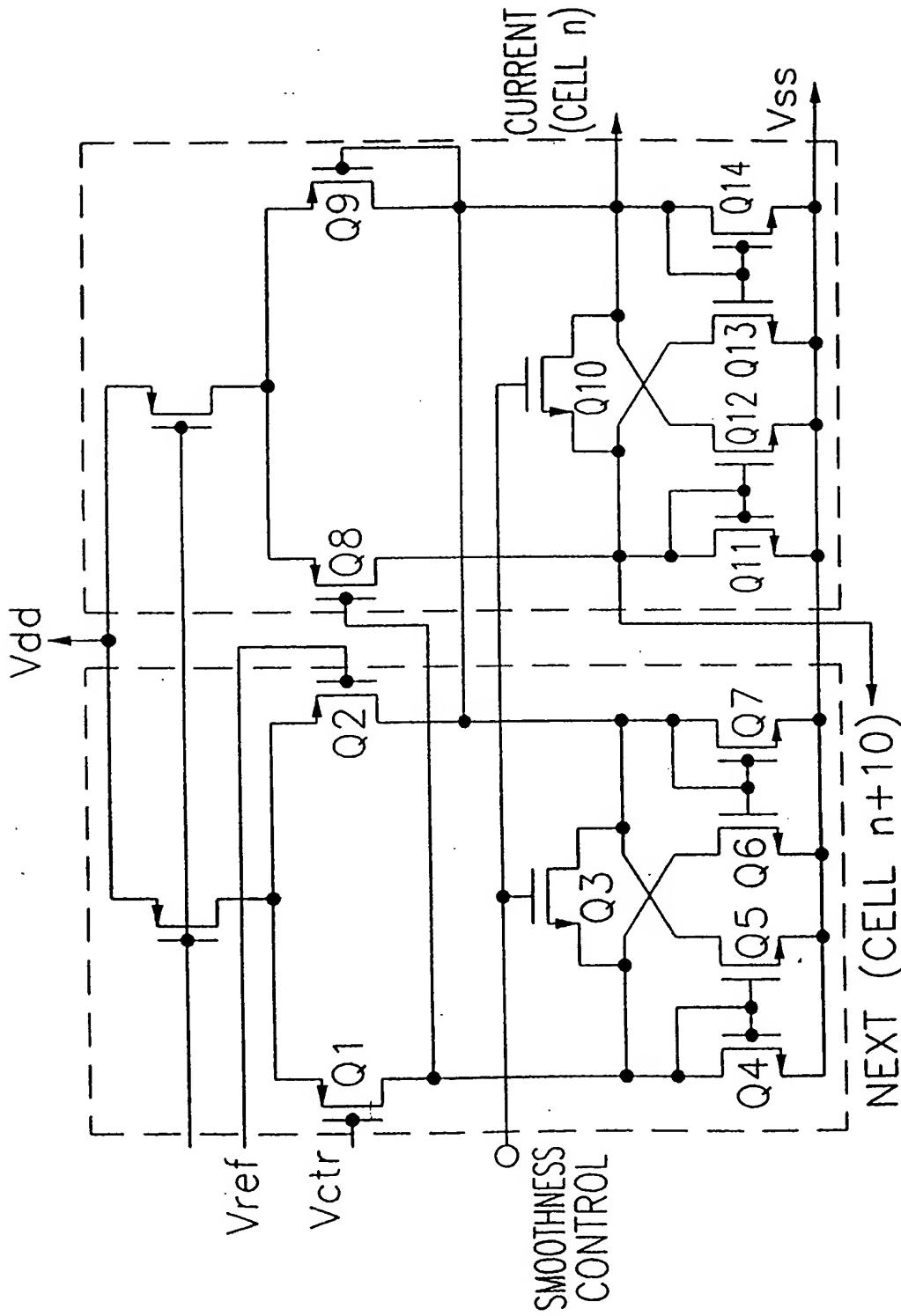
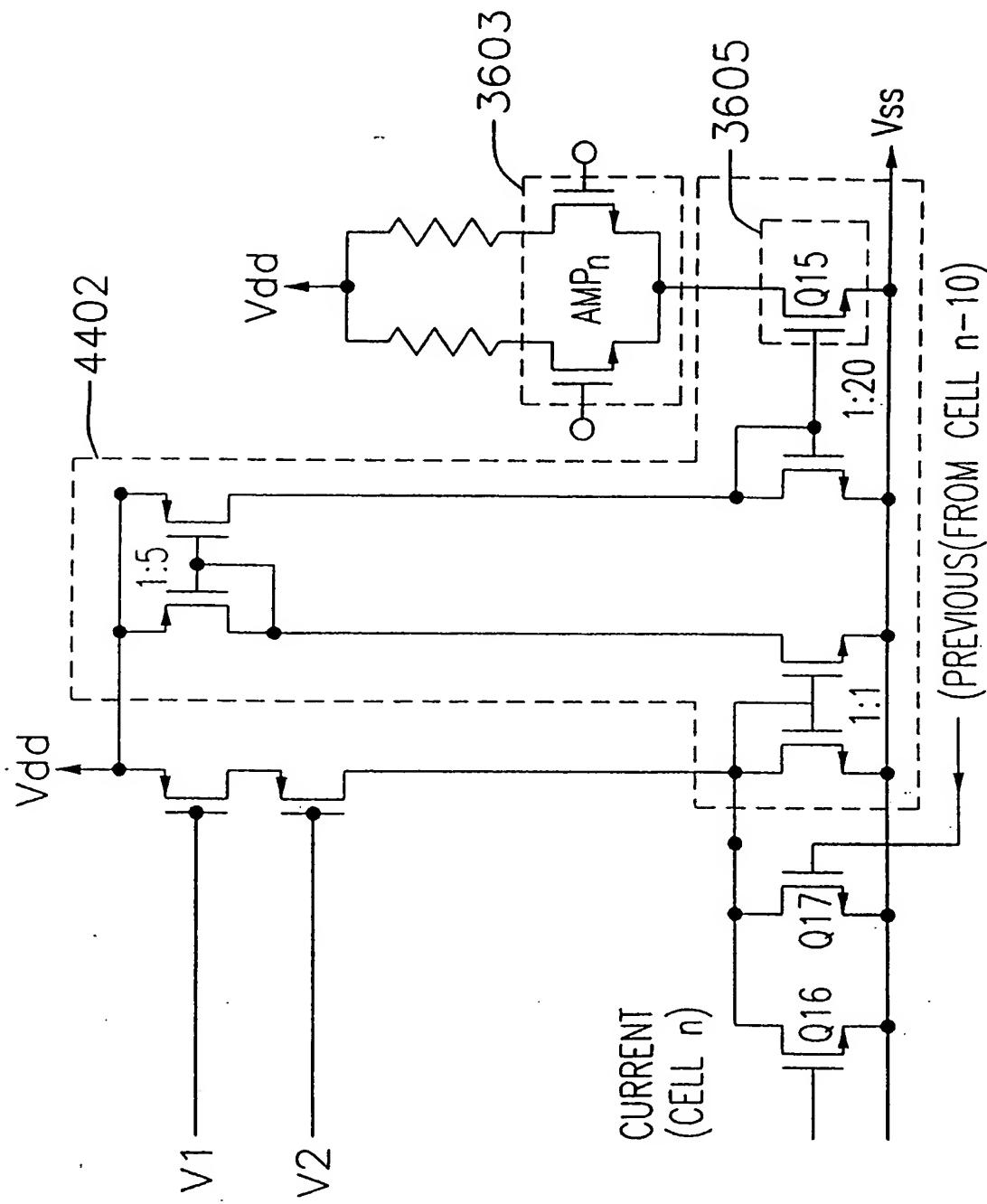
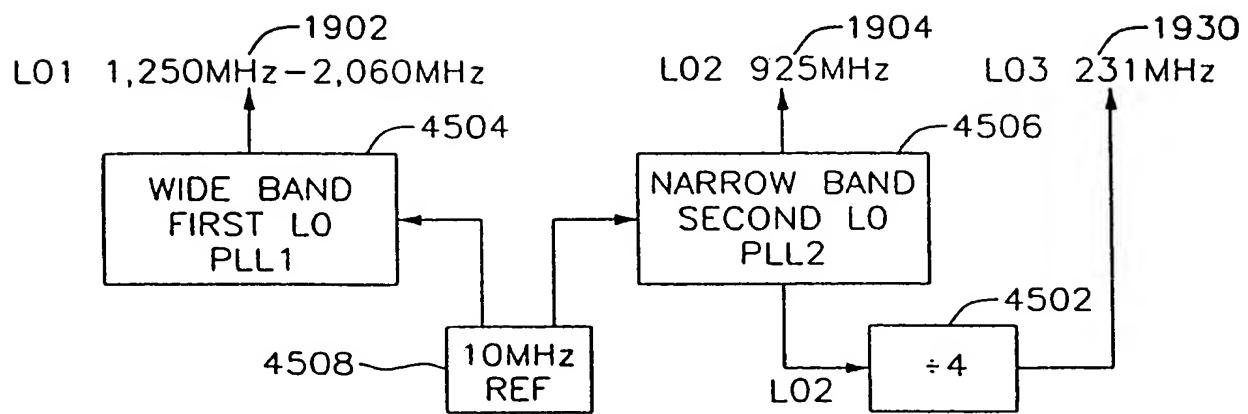


FIG. 44b



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 Title: Large Gain Range, High Linearity, Low Noise MOS
 VGA

FIG. 45



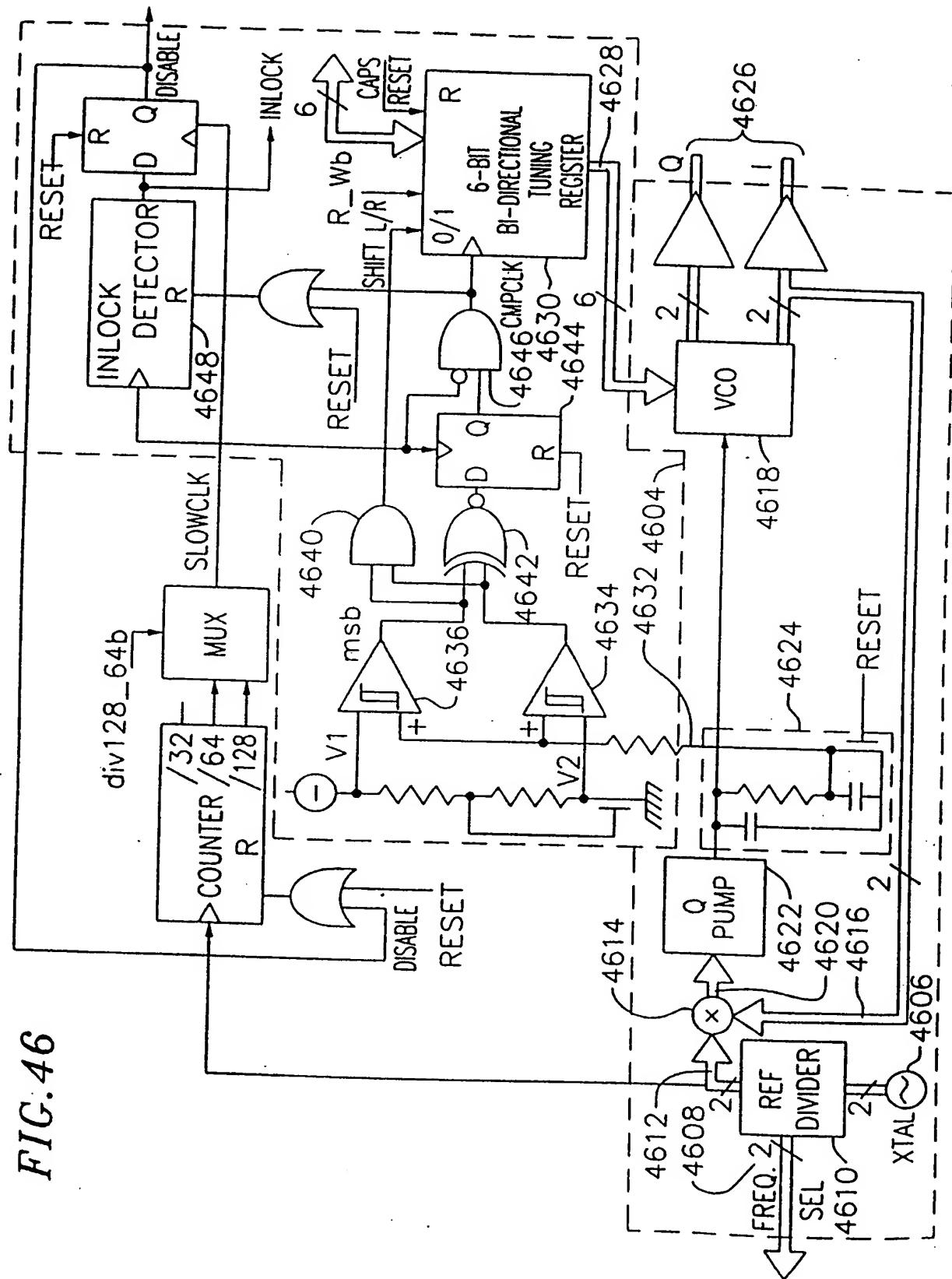
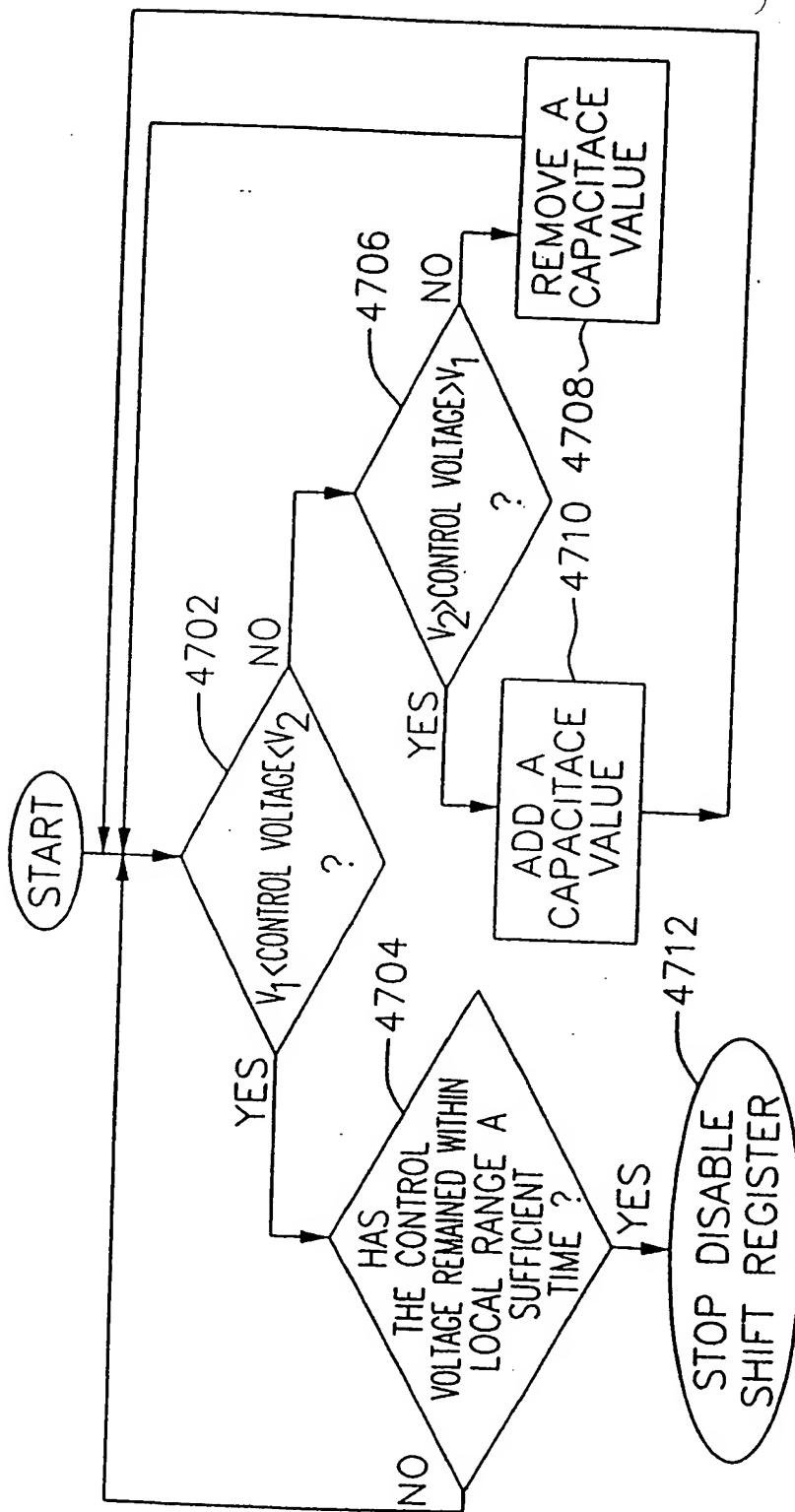
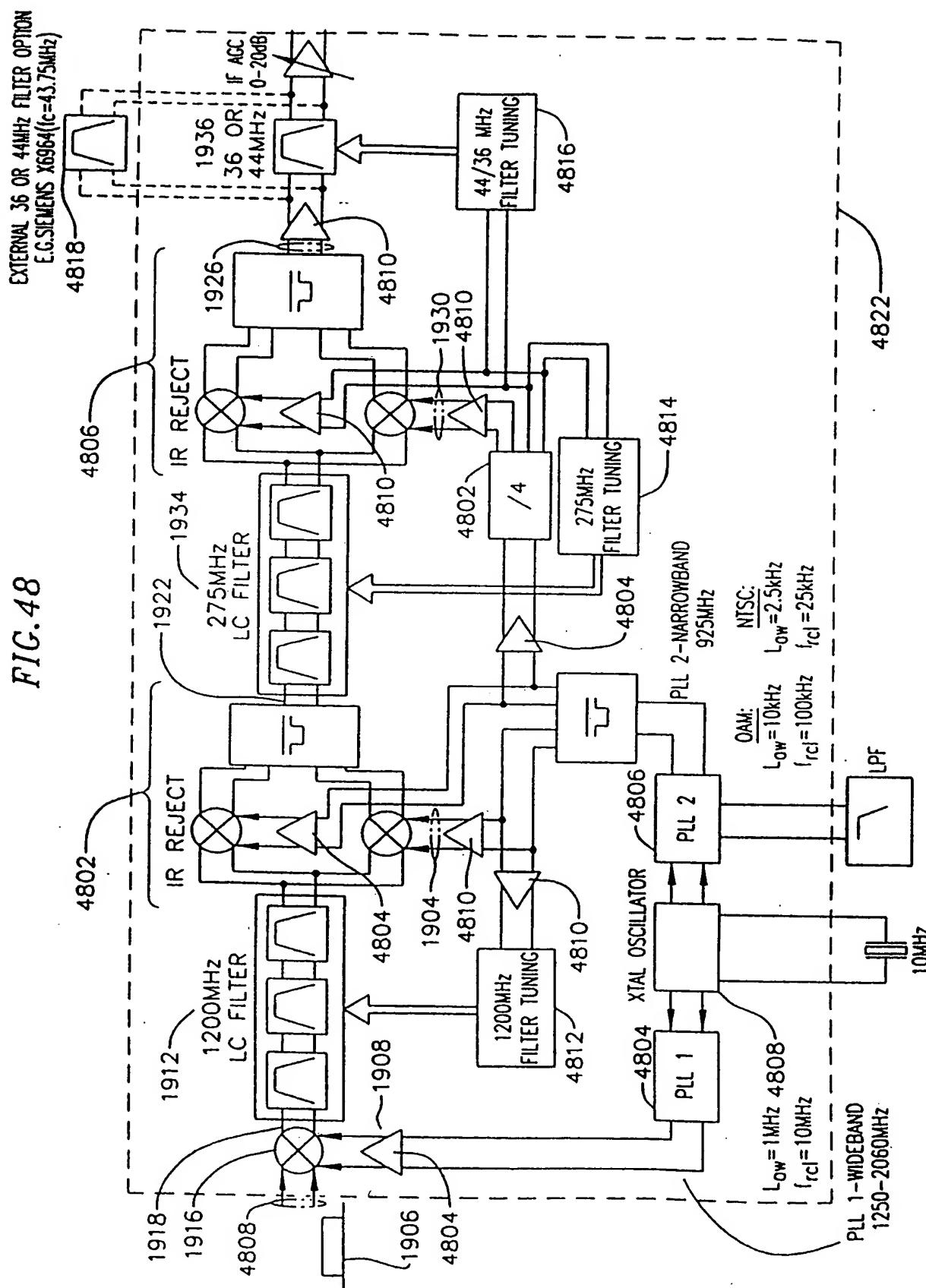


FIG. 47



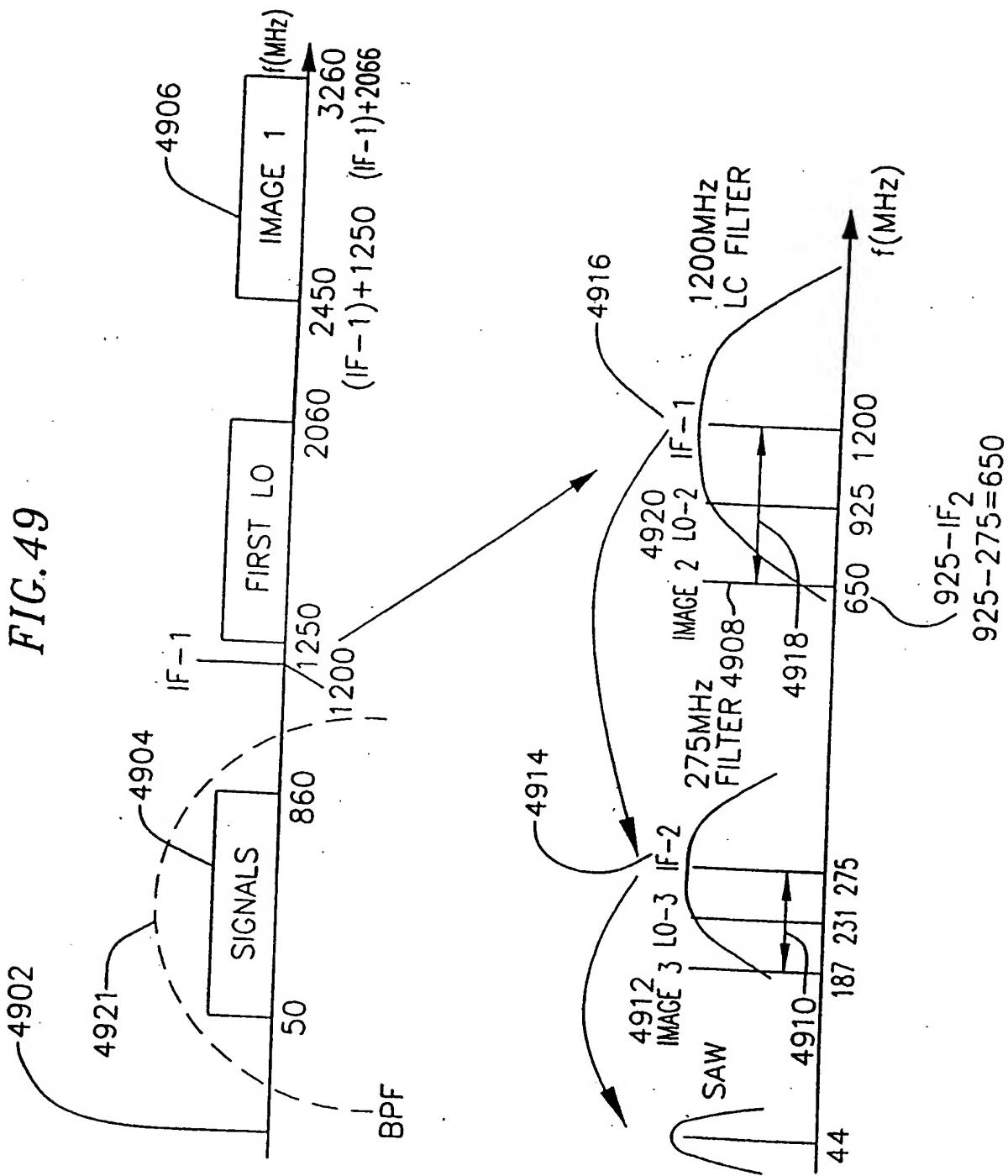
Appl. No. To Be Assigned; Filed: Herewith
 Dkt. No. 1875.138000G; Group Art Unit: To Be Assigned
 Inventors: Arya R. Behzad; Tel.: (202) 371-2600
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FIG. 48



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VGA

FIG. 49



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VGA

FIG. 50

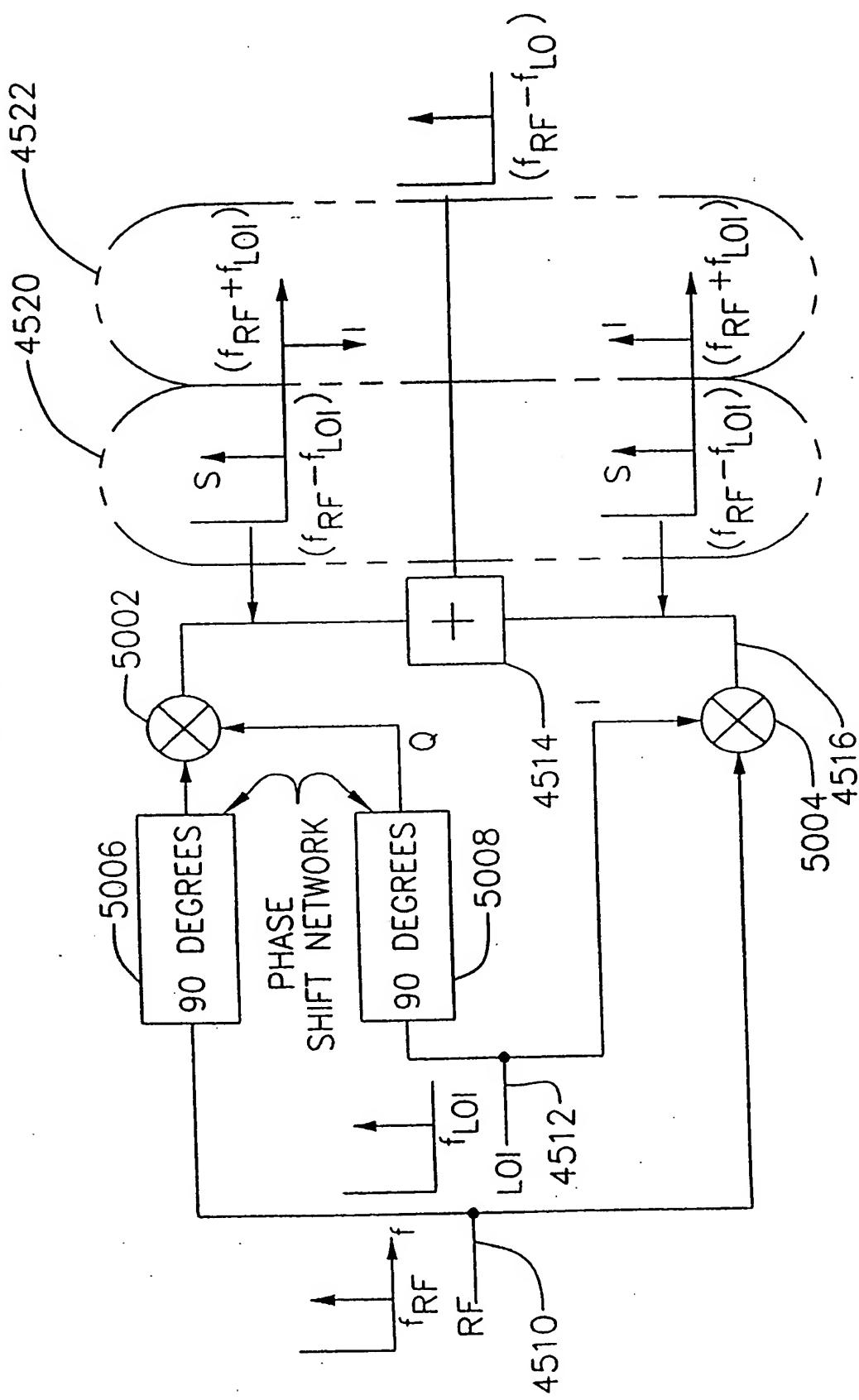
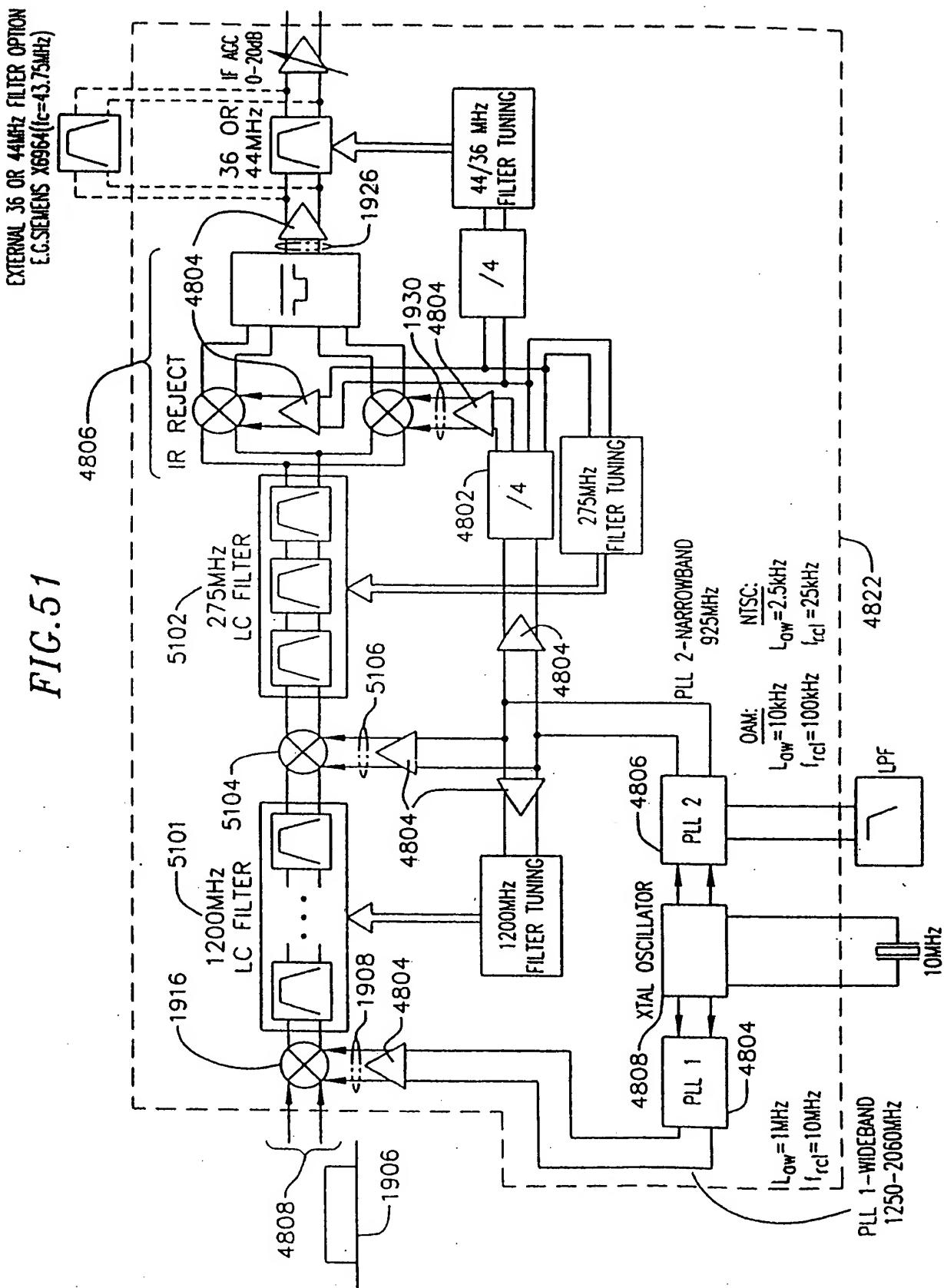
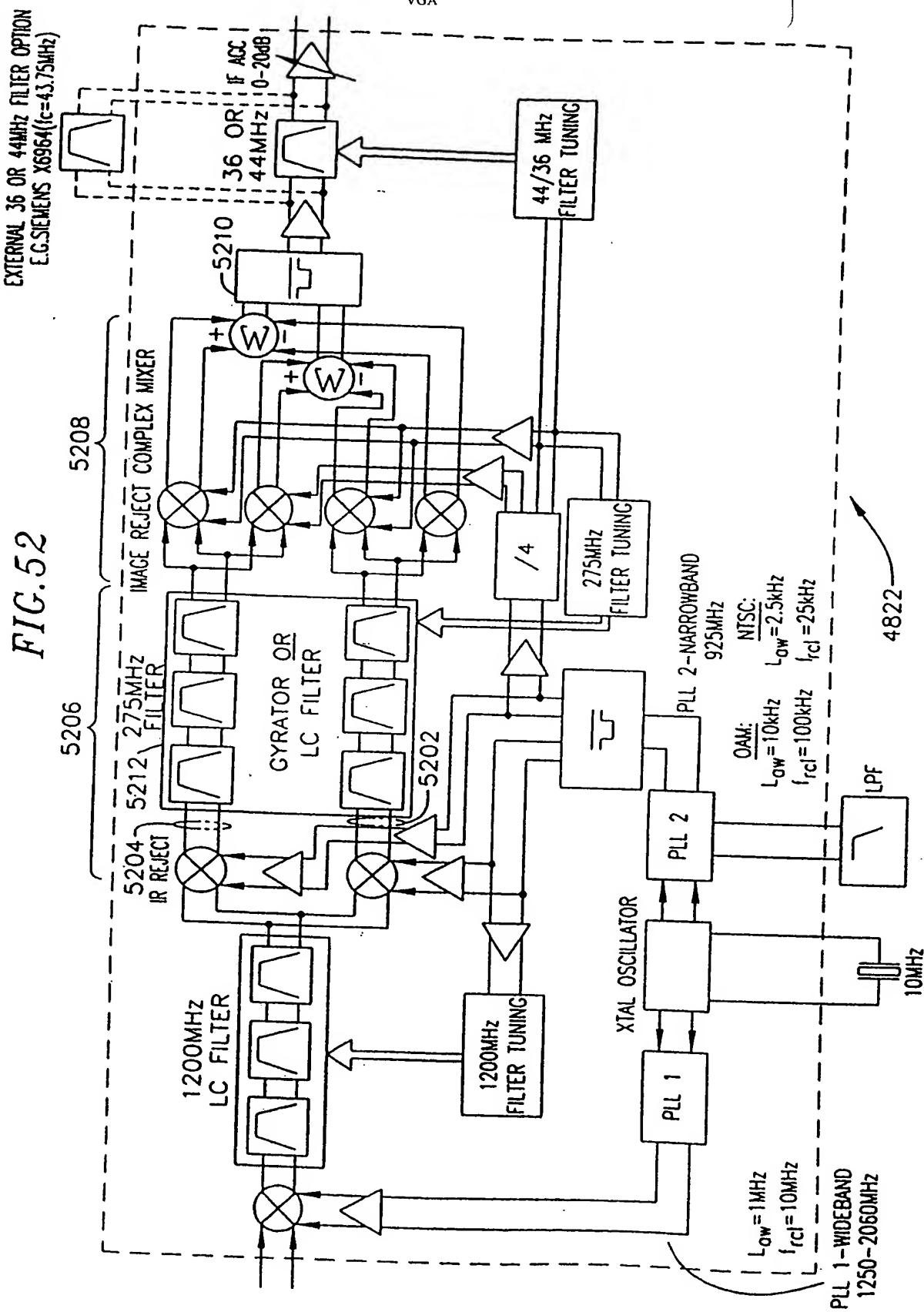


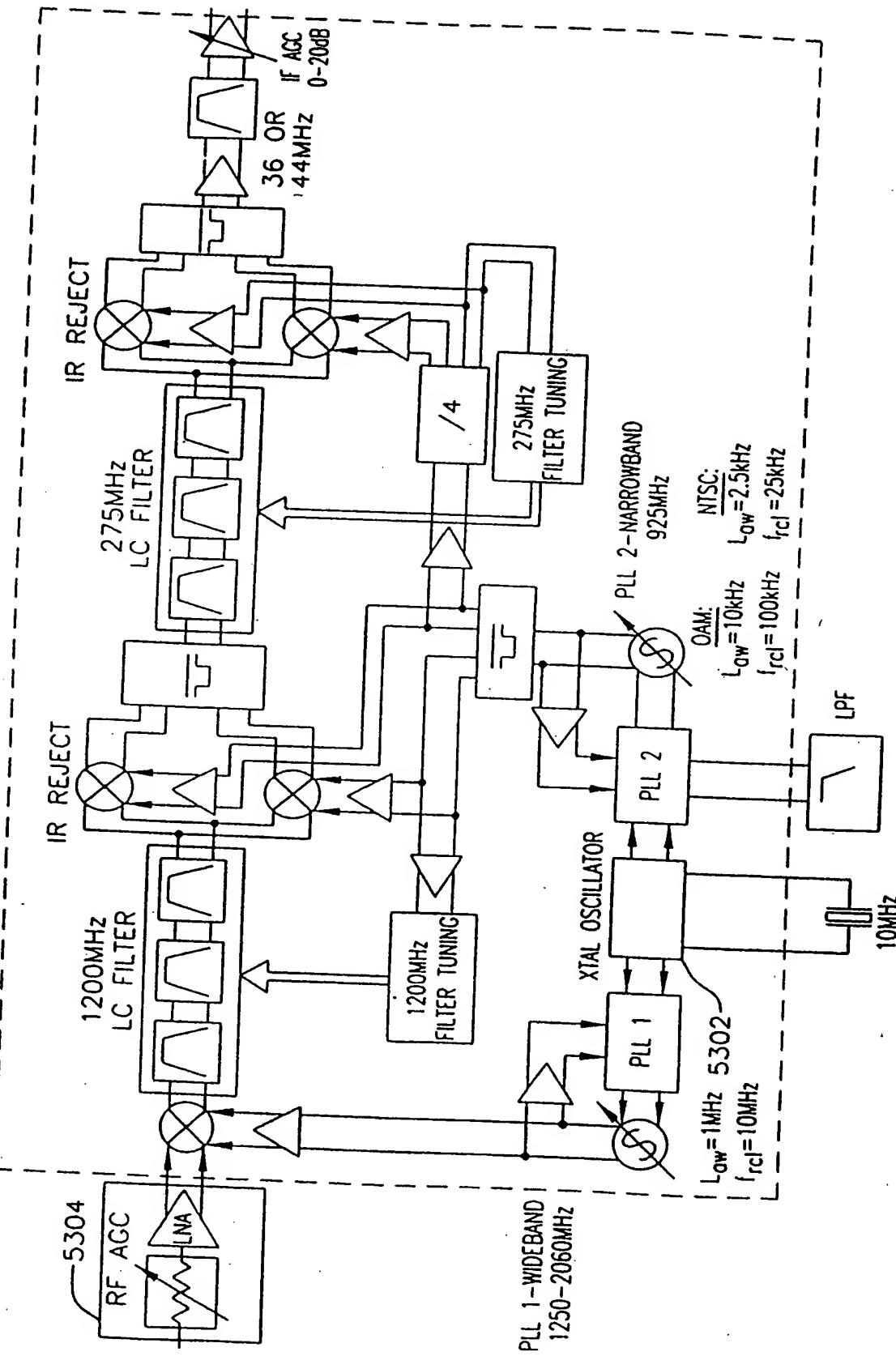
FIG. 51





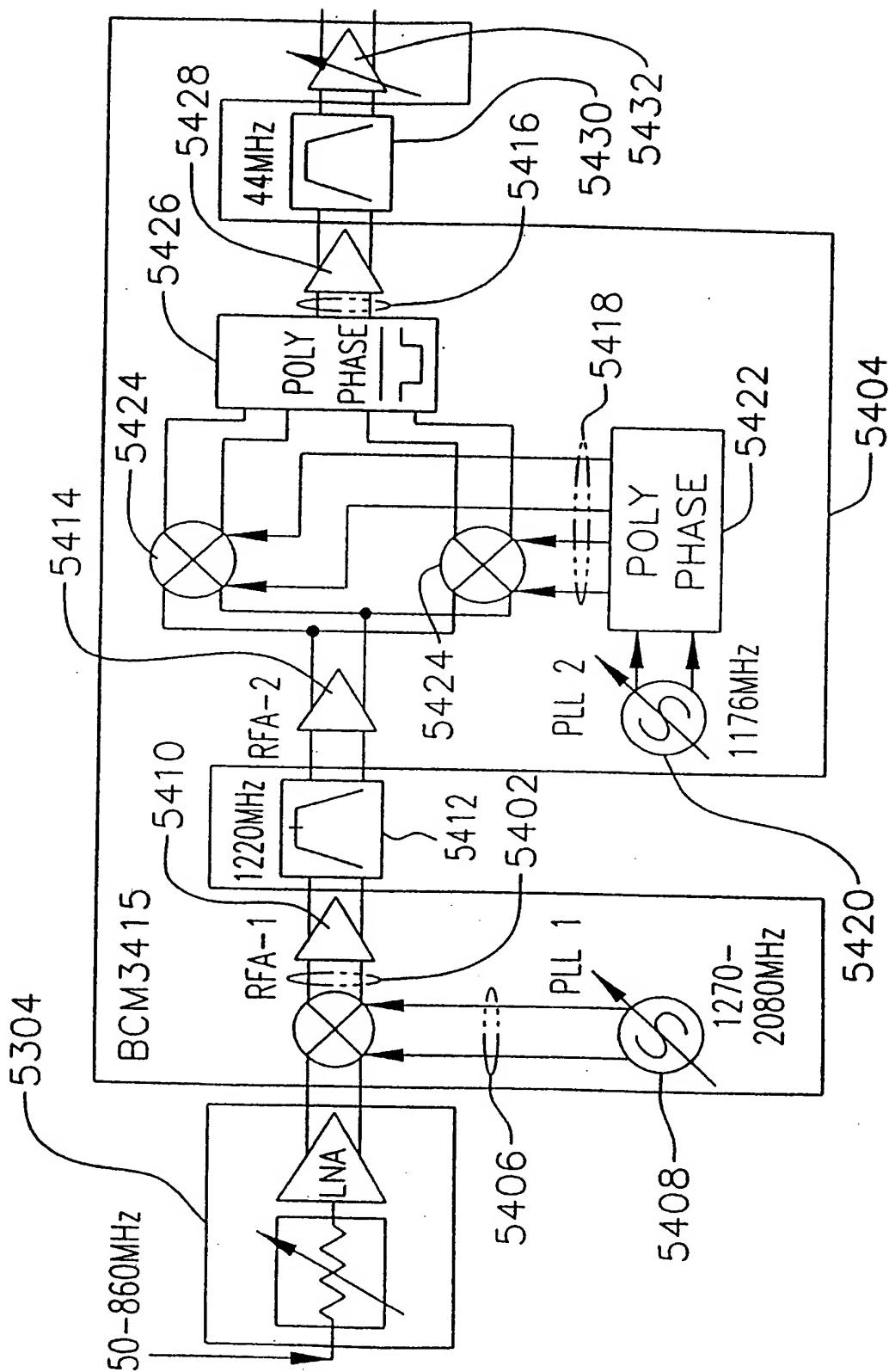
Appl. No. To Be Assigned; Filed: Herewith
 Dkt. No. 1875.138000G; Group Art Unit: To Be Assigned
 Inventors: Arya R. Behzad; Tel.: (202) 371-2600
 Title: Large Gain Range, High Linearity, Low Noise MOS
 VGA

FIG. 53
 CATV TUNER

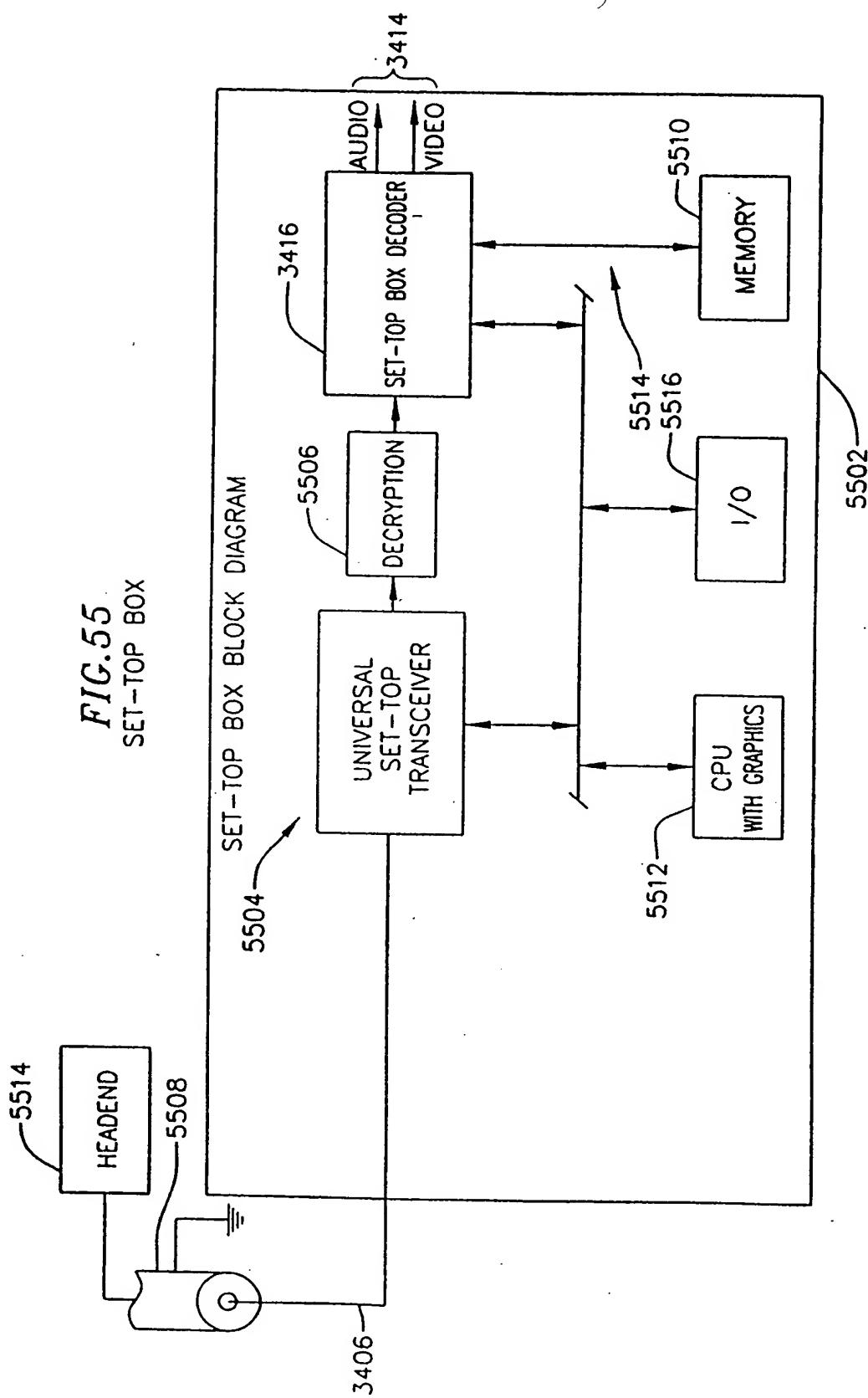


Appl. No. *To Be Assigned*; Filed: *Herewith*
Dkt. No. 1875.138000G; Group Art Unit: *To Be Assigned*
Inventors: Arya R. Behzad; Tel.: (202) 371-2600
Title: Large Gain Range, High Linearity, Low Noise MOS
VGA

FIG. 54

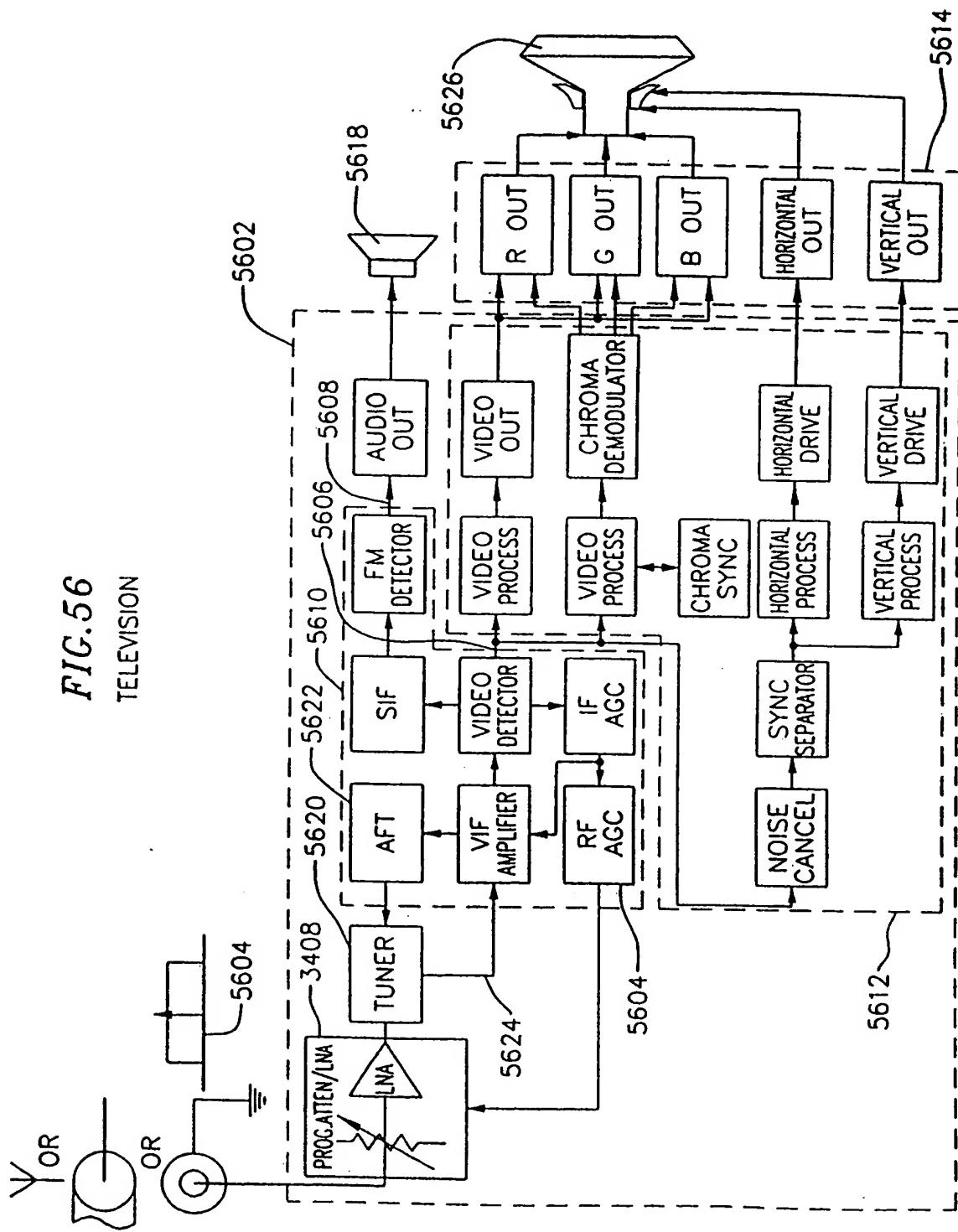


Appl. No. *To Be Assigned*; Filed: *Herewith*
 Dkt. No. 1875.138000G; Group Art Unit: *To Be Assigned*
 Inventors: Arya R. Behzad; Tel.: (202) 371-2600
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 VGA



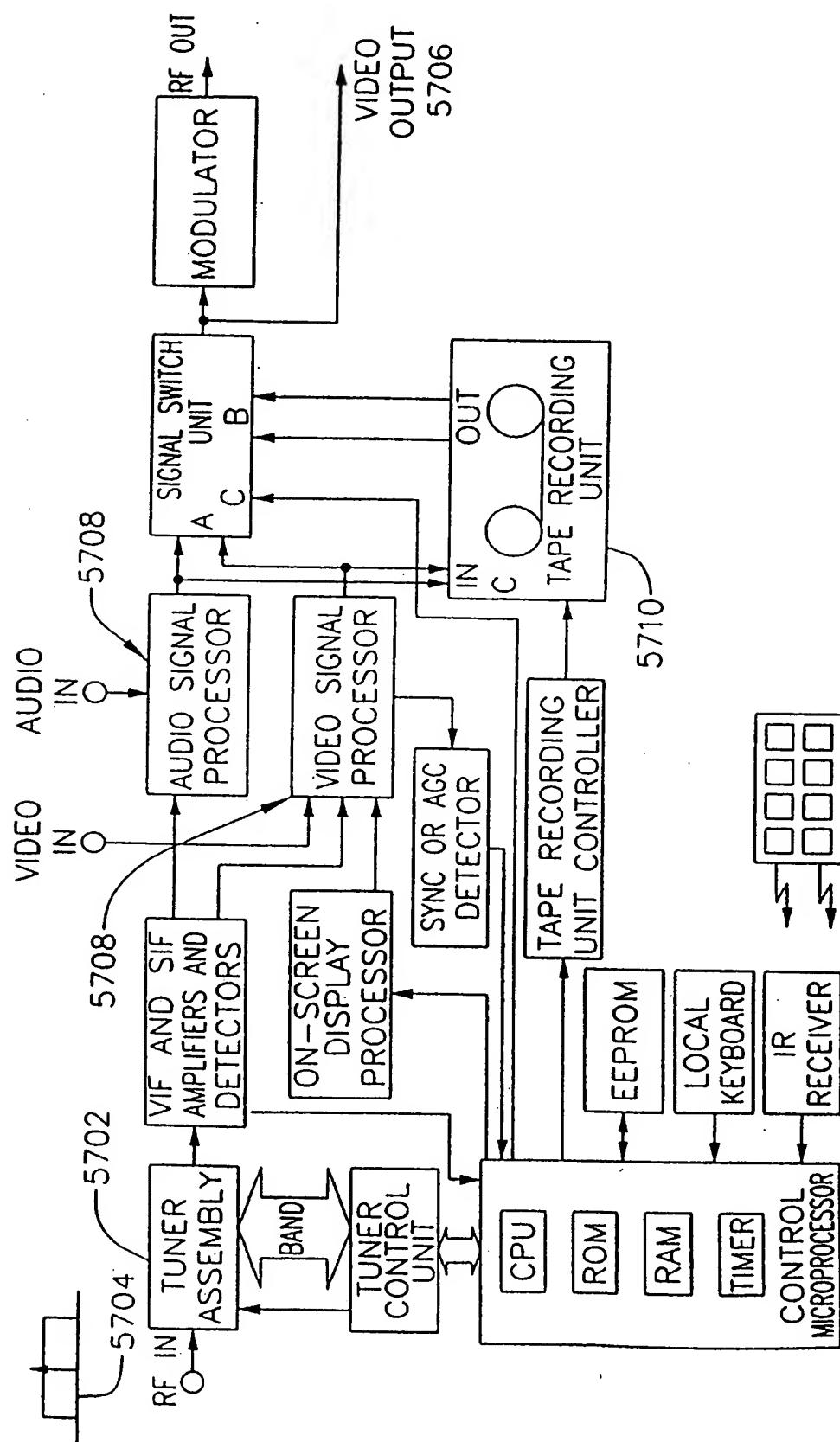
Appl. No. *To Be Assigned*; Filed: *Herewith*
Dkt. No. 1875.138000G; Group Art Unit: *To Be Assigned*
Inventors: Arya R. Behzad; Tel.: (202) 371-2600
Title: Large Gain Range, High Linearity, Low Noise MOS
VGA

FIG. 56
TELEVISION



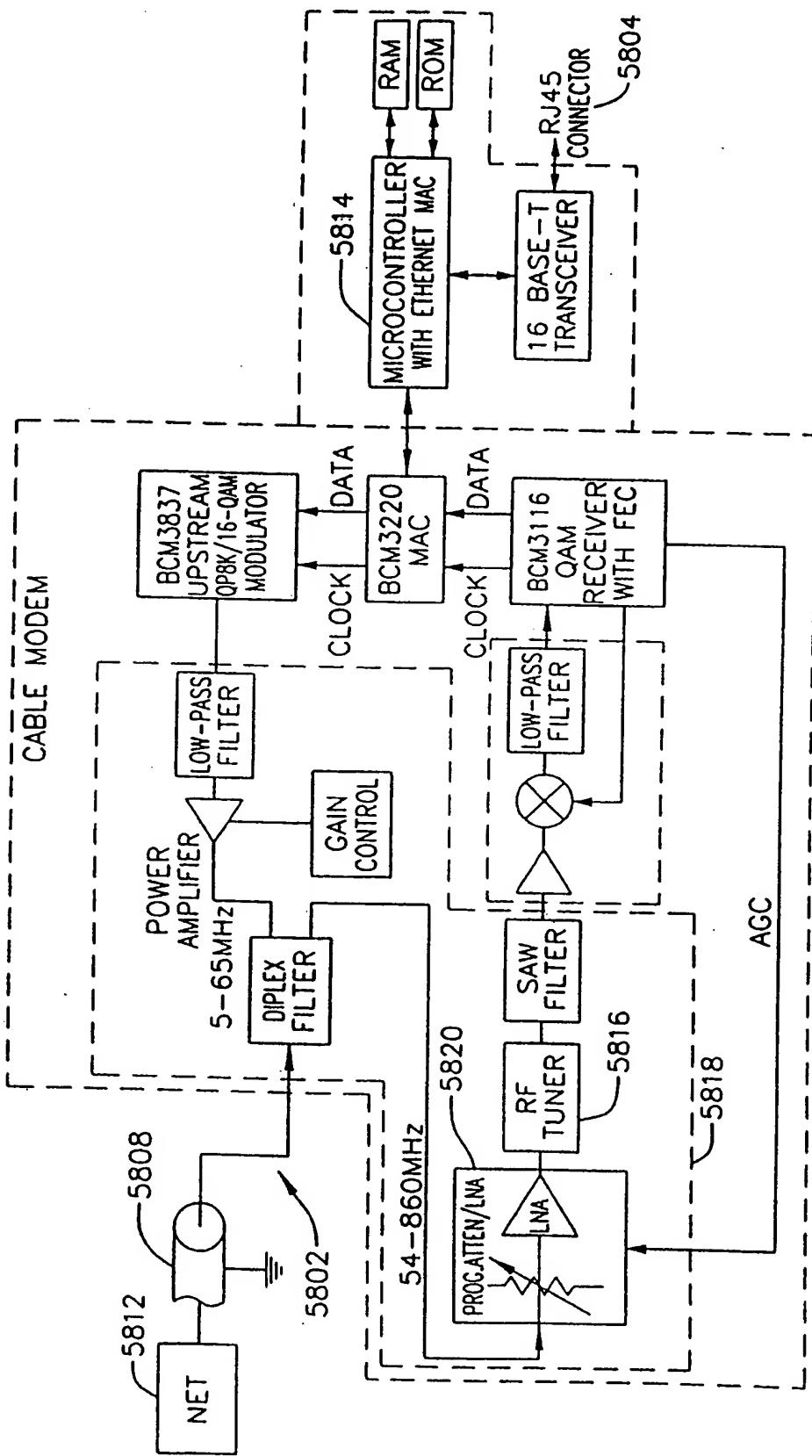
Appl. No. *To Be Assigned*; Filed: *Herewith*
Dkt. No. 1875.138000G; Group Art Unit: *To Be Assigned*
Inventors: Arya R. Behzad; Tel.: (202) 371-2600
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FIG. 57
VCR BLOCK DIAGRAM



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FIG. 58



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VGA

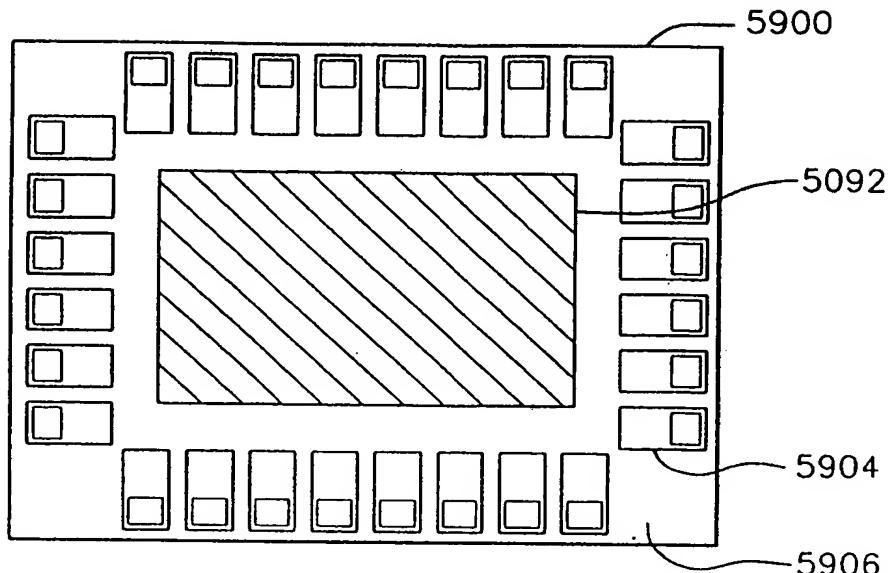


FIG. 59

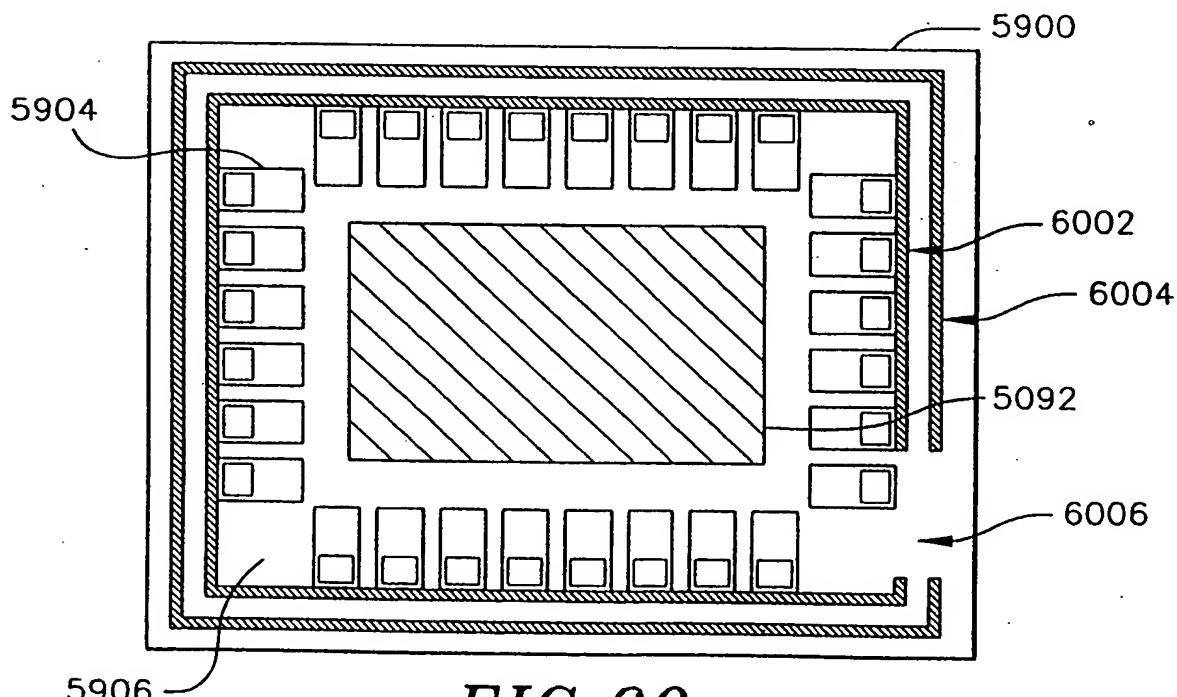
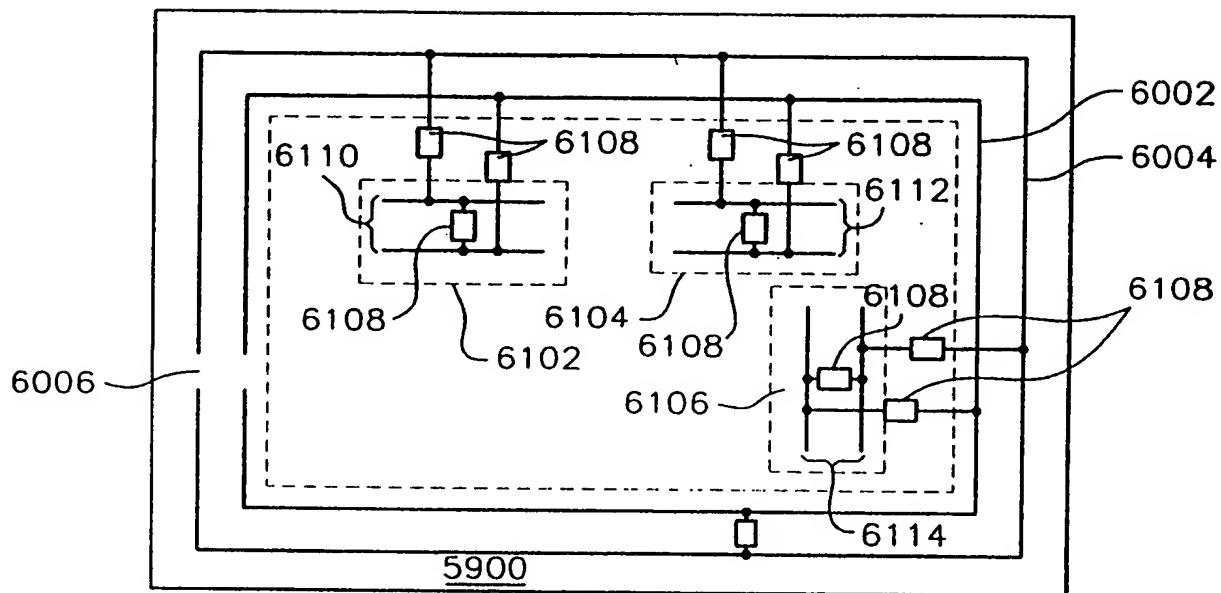
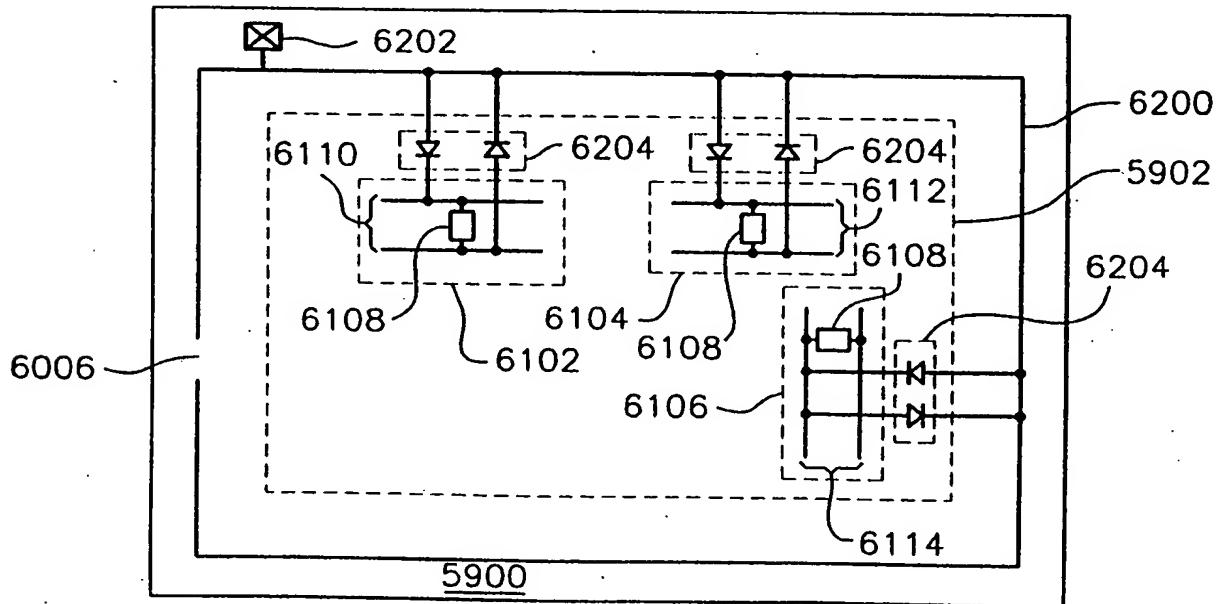
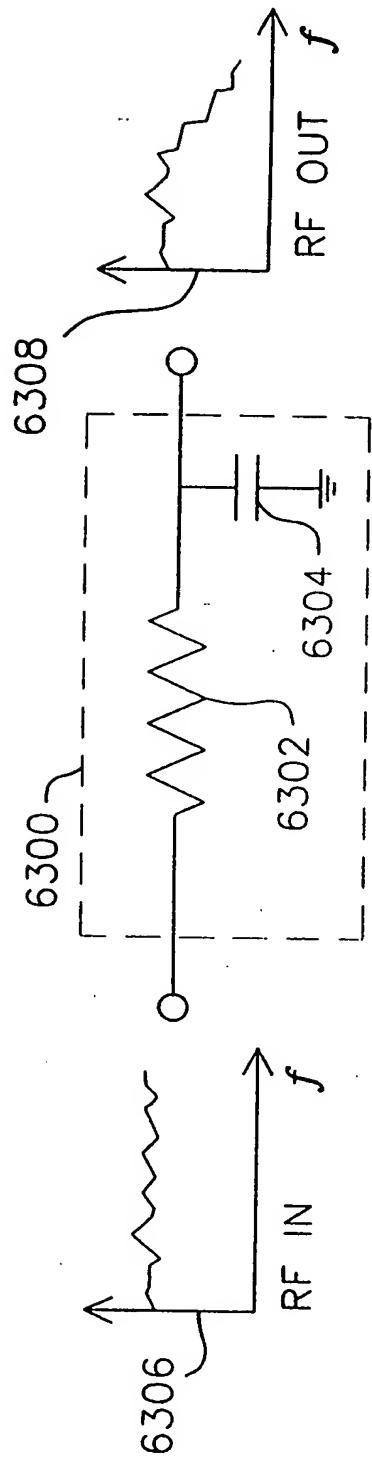


FIG. 60

FIG. 61**FIG. 62**

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VGA

FIG. 63



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Inventors: Arya R. Behzad; Tel.: (202) 371-2600
Title: Large Gain Range, High Linearity, Low Noise MOS
VGA

FIG. 64

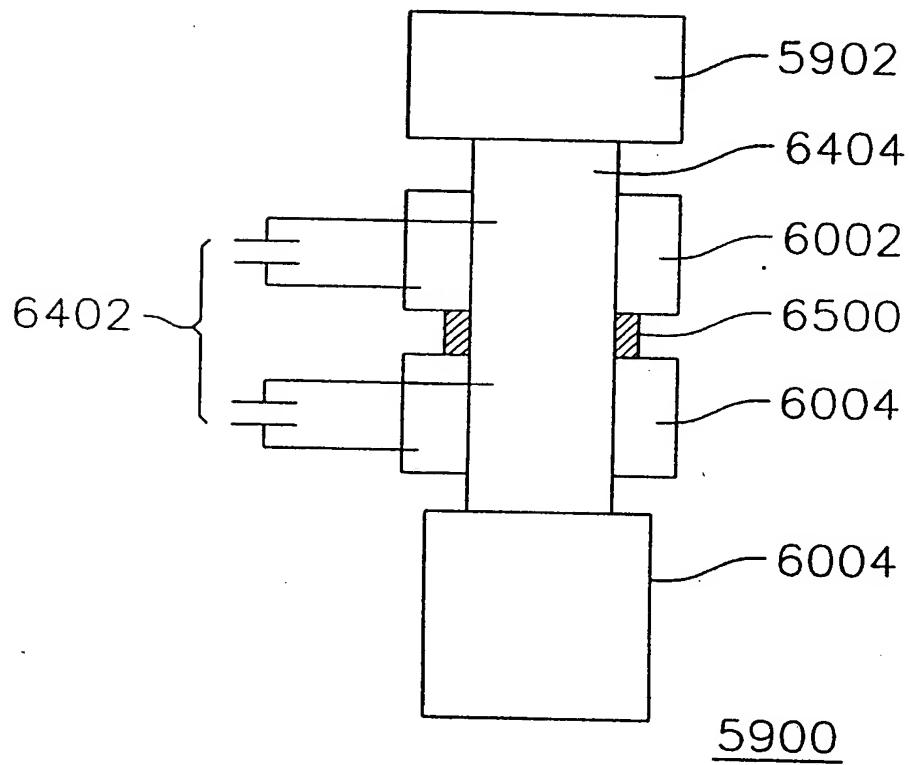
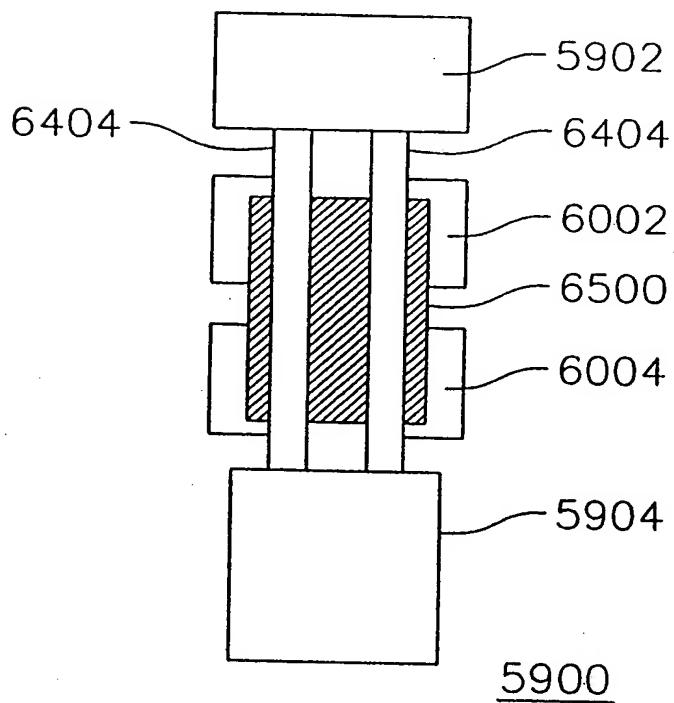
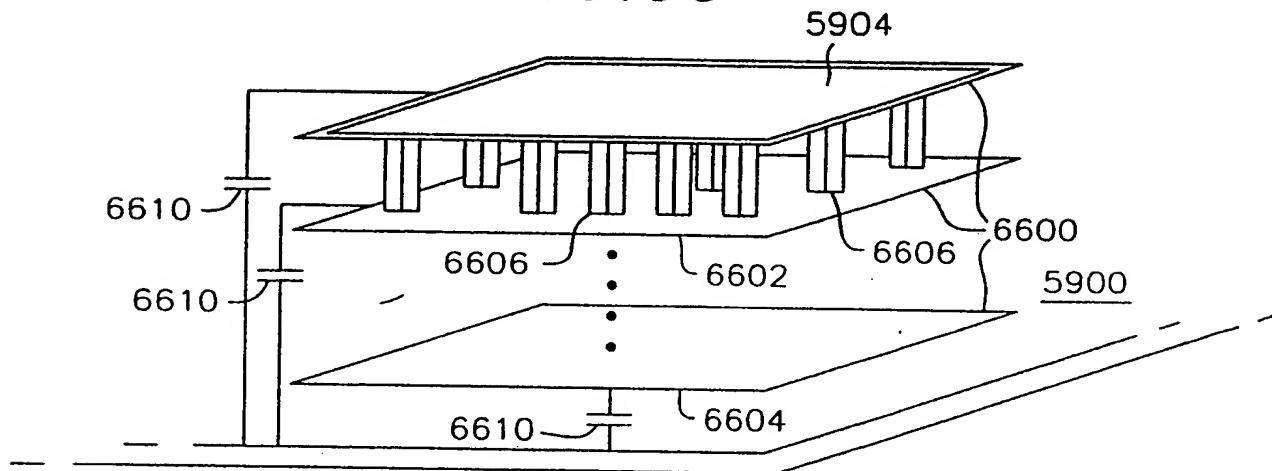
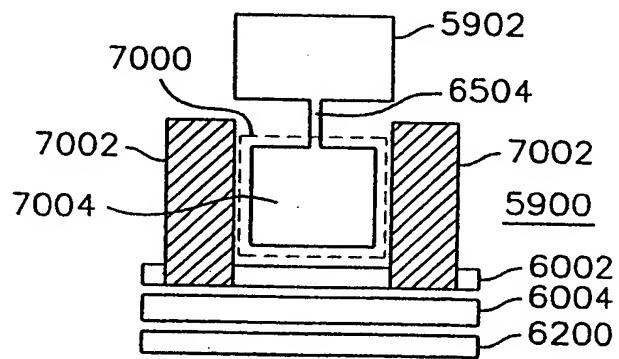


FIG. 65

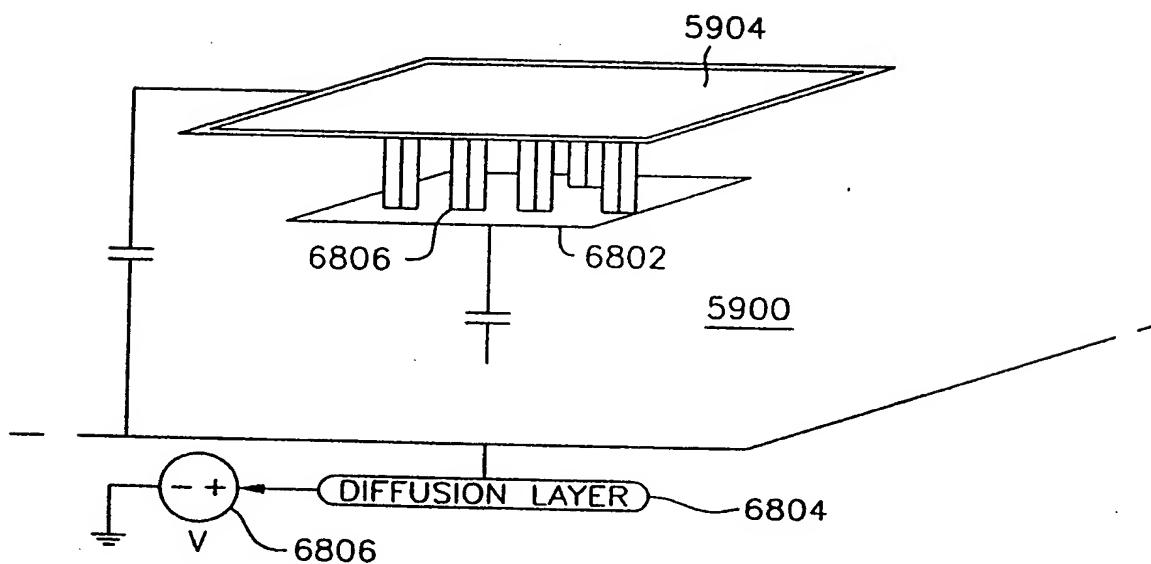


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 VGA

FIG. 66**FIG. 67**

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FIG. 68



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 Title: Large Gain Range, High Linearity, Low Noise MOS
 VGA

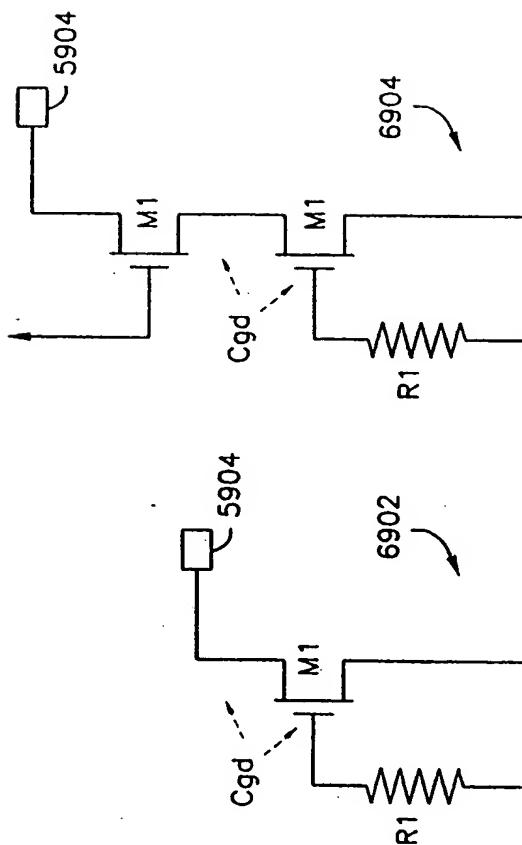


FIG. 69a
PRIOR ART

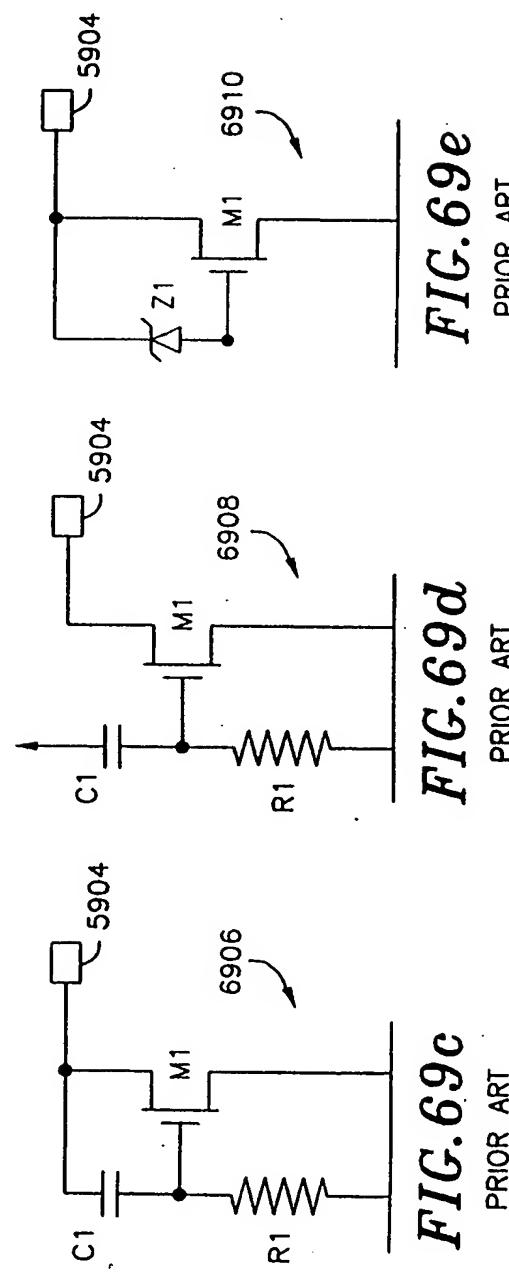


FIG. 69e
PRIOR ART

FIG. 69d
PRIOR ART

FIG. 69c
PRIOR ART

FIG. 69b
PRIOR ART

FIG. 70

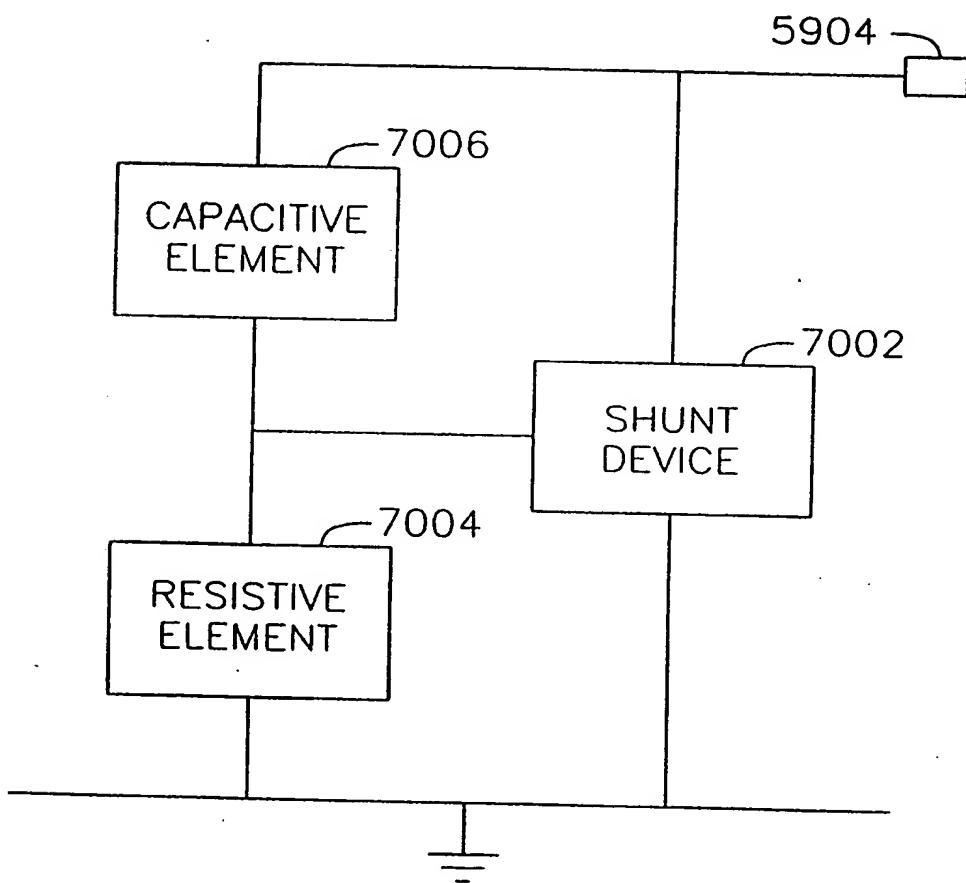


FIG. 71

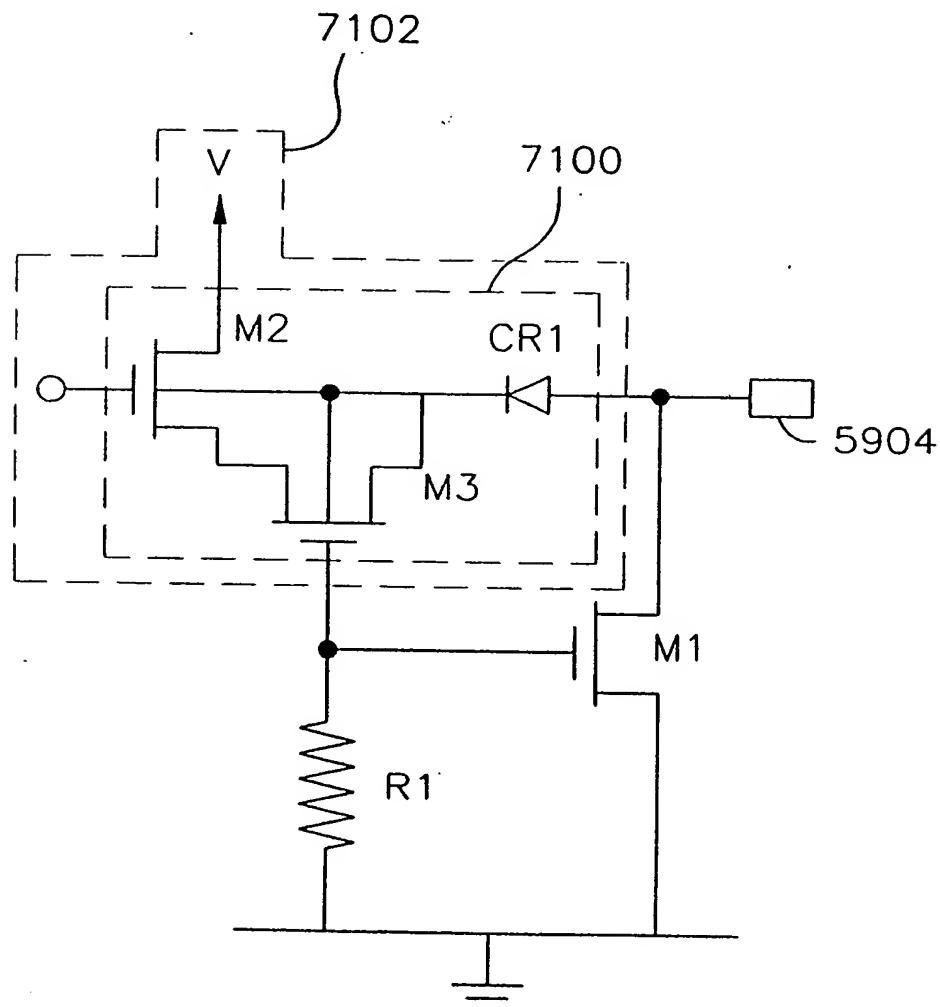
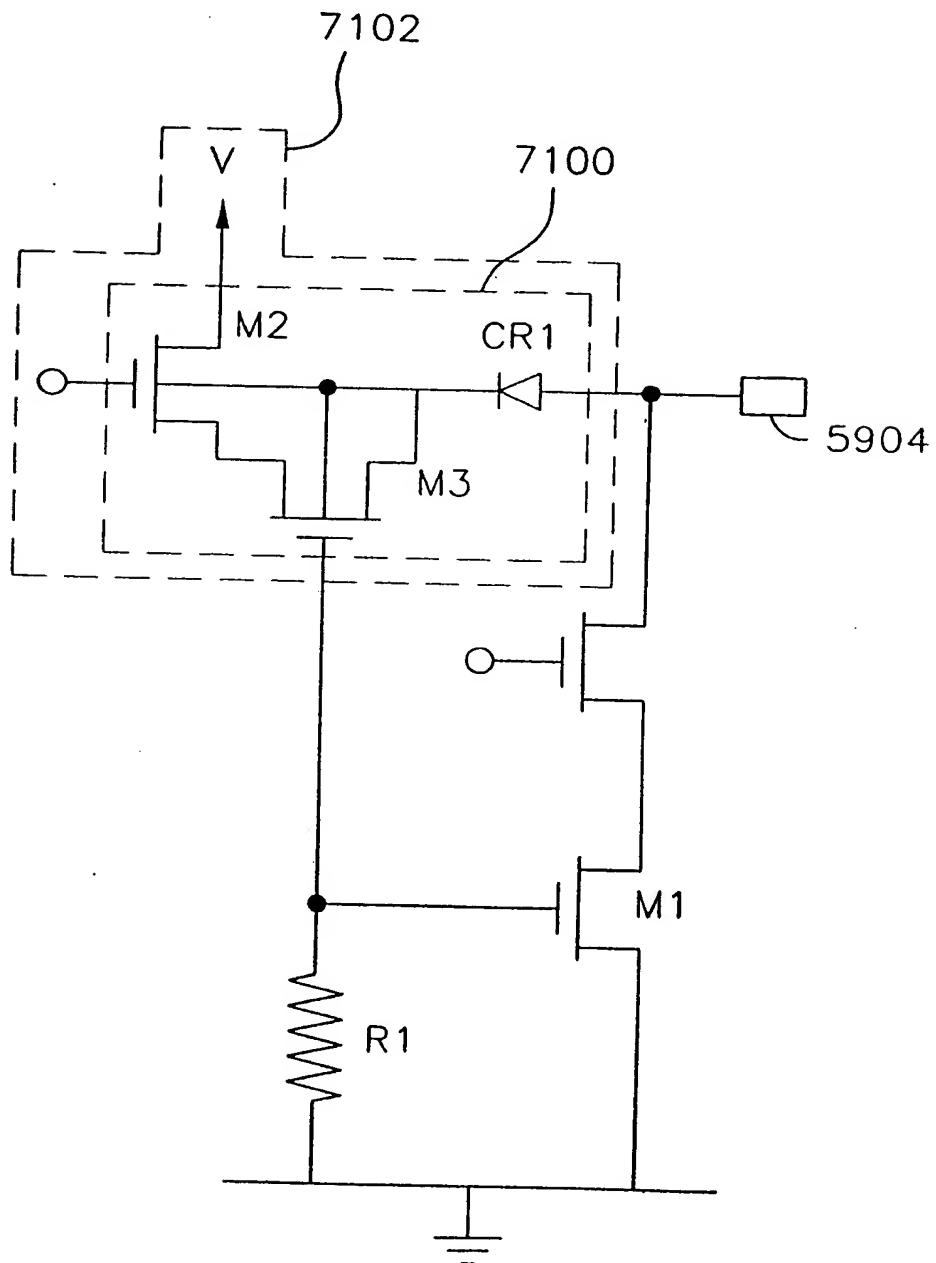
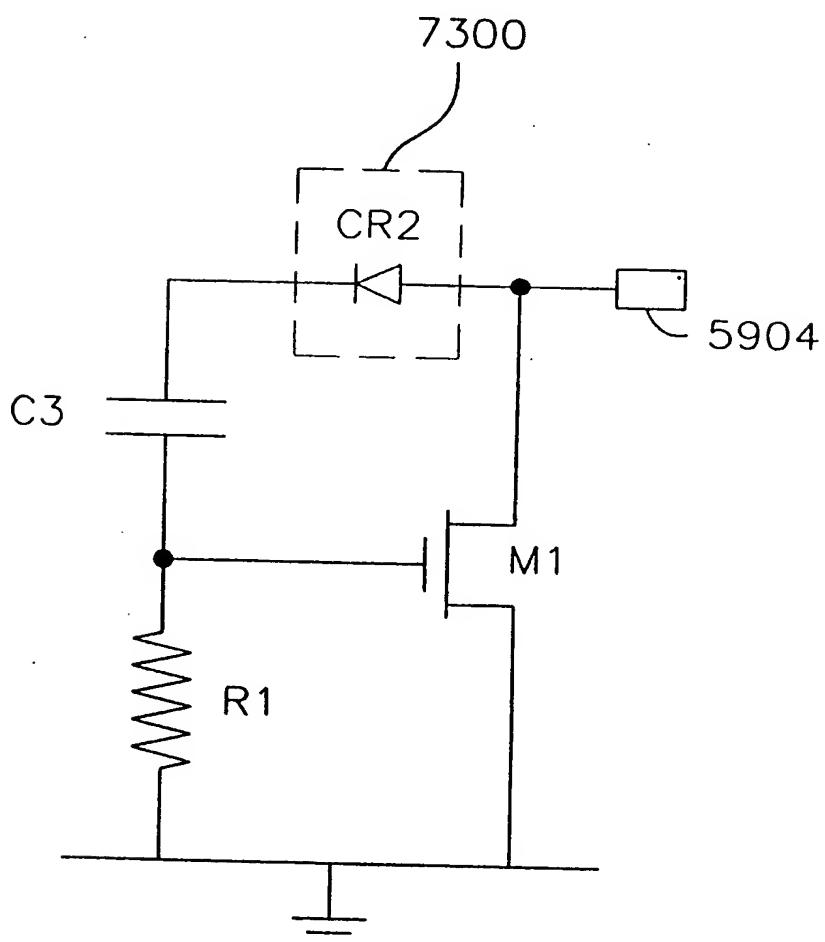


FIG. 72



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Title: Large Gain Range, High Linearity, Low Noise MOS
VGA

FIG. 73



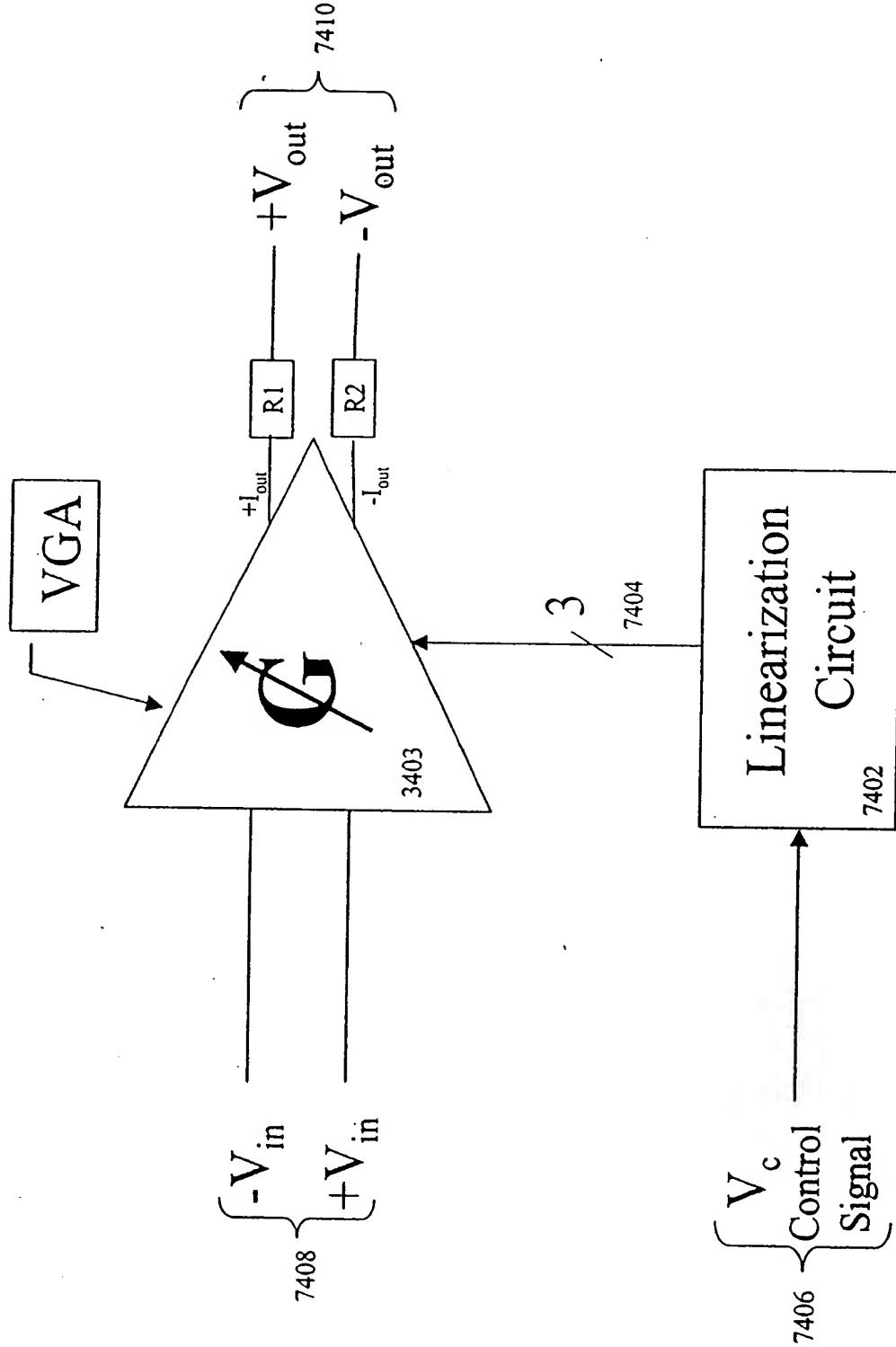


FIG. 74

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Title: Large Gain Range, High Linearity, Low Noise MOS
VGA

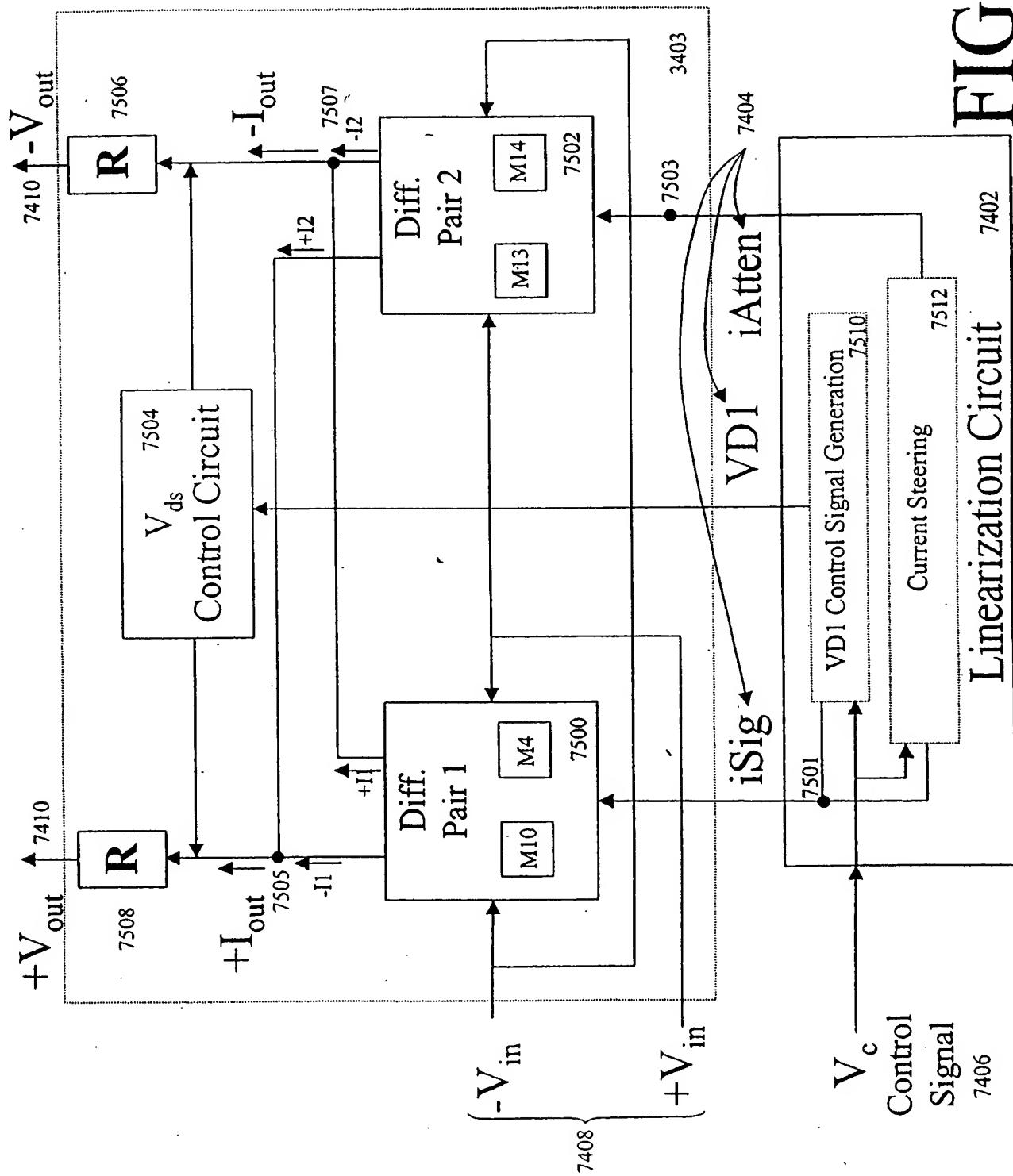


FIG. 75
Linearization Circuit
7402
32

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VGA

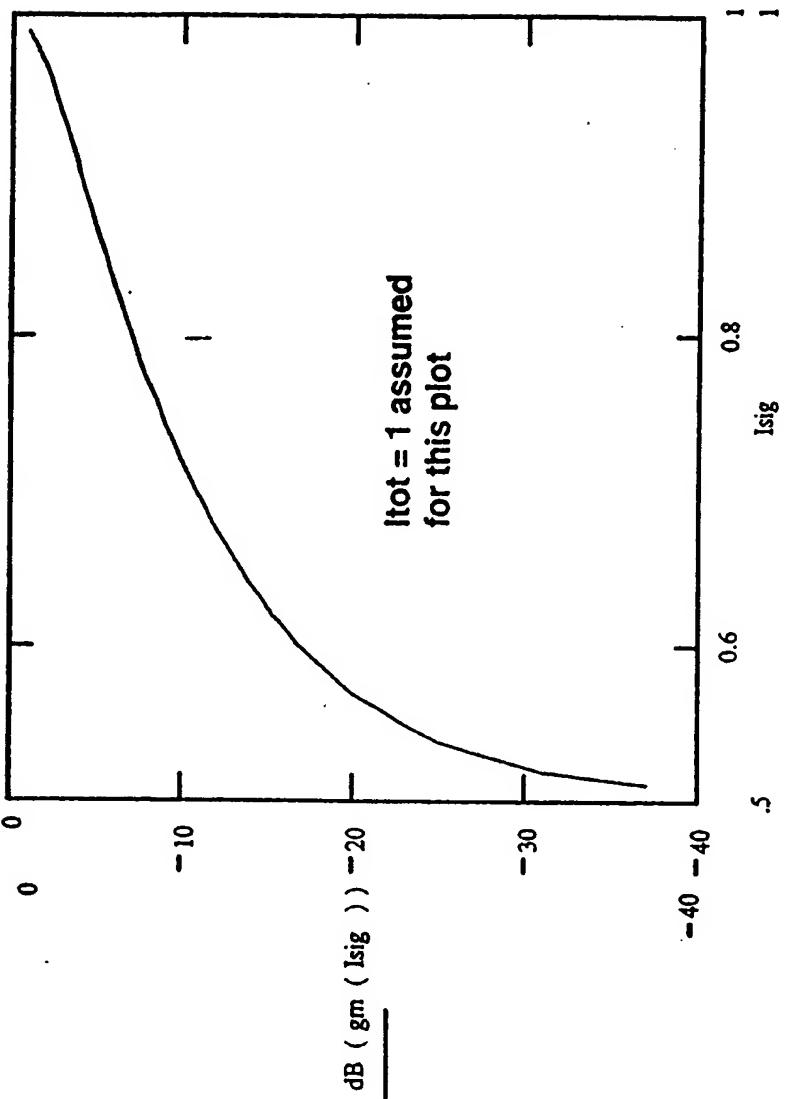
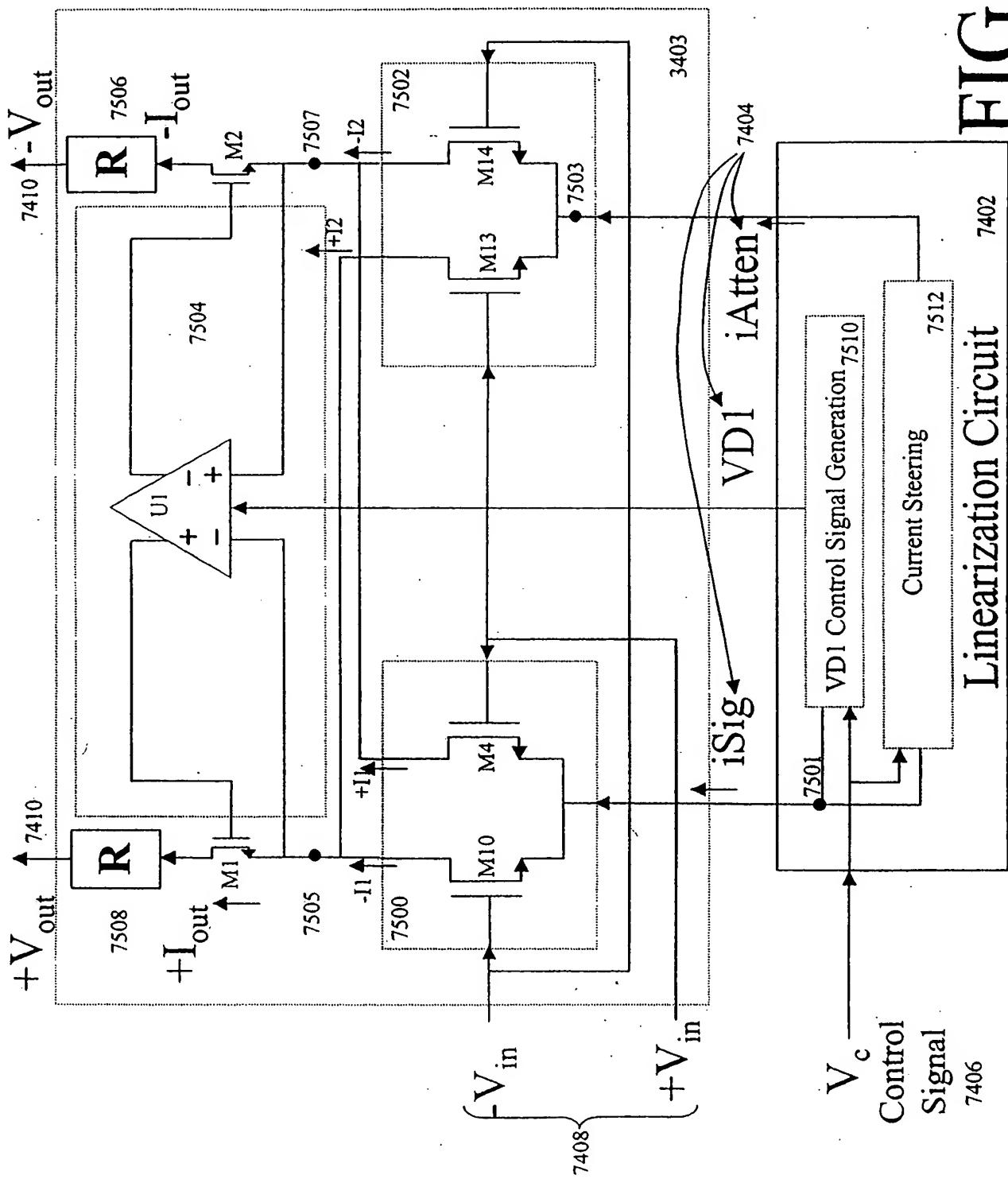


FIG 76

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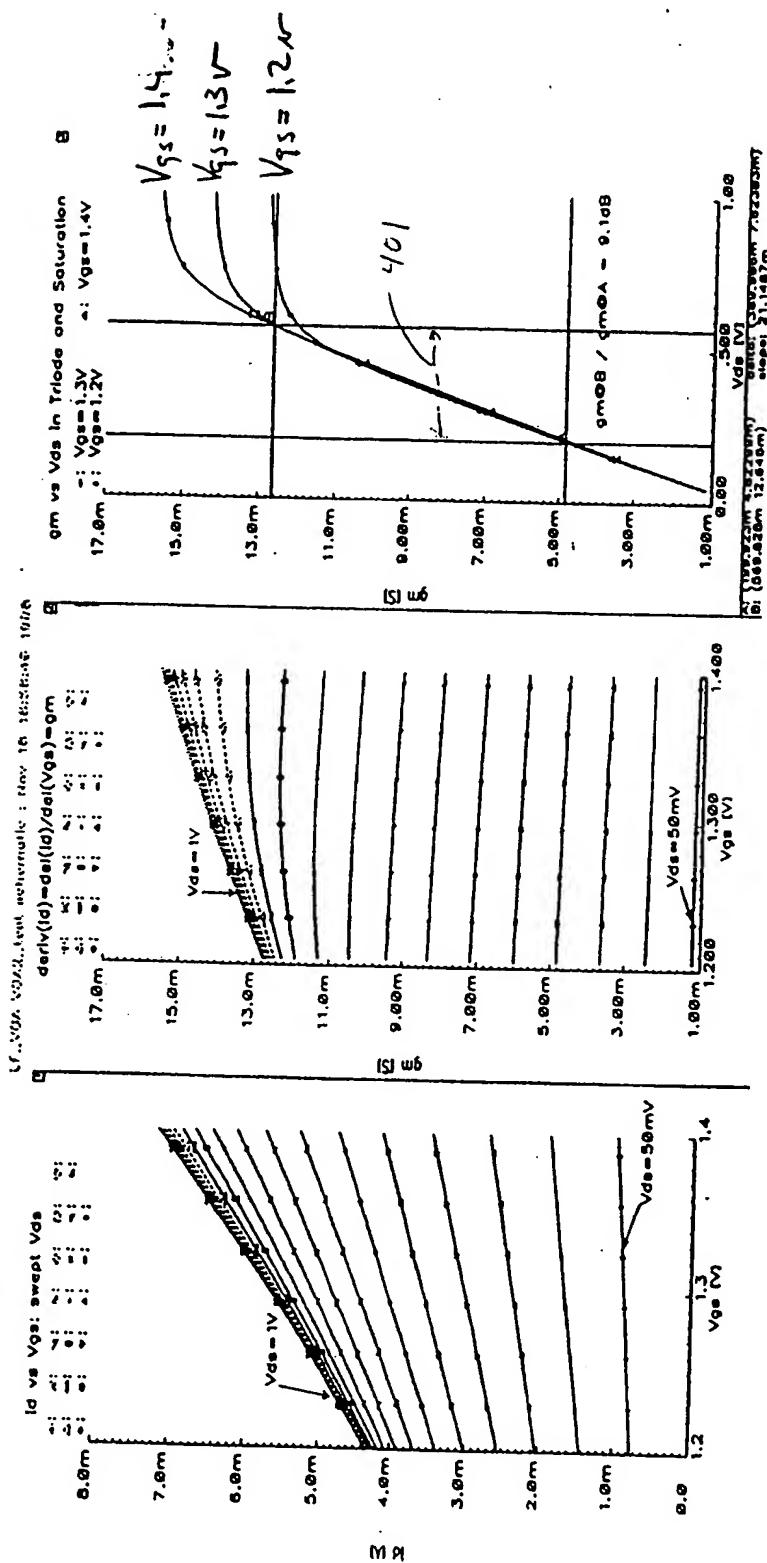


FIG 78a

FIG 78b

FIG 78c

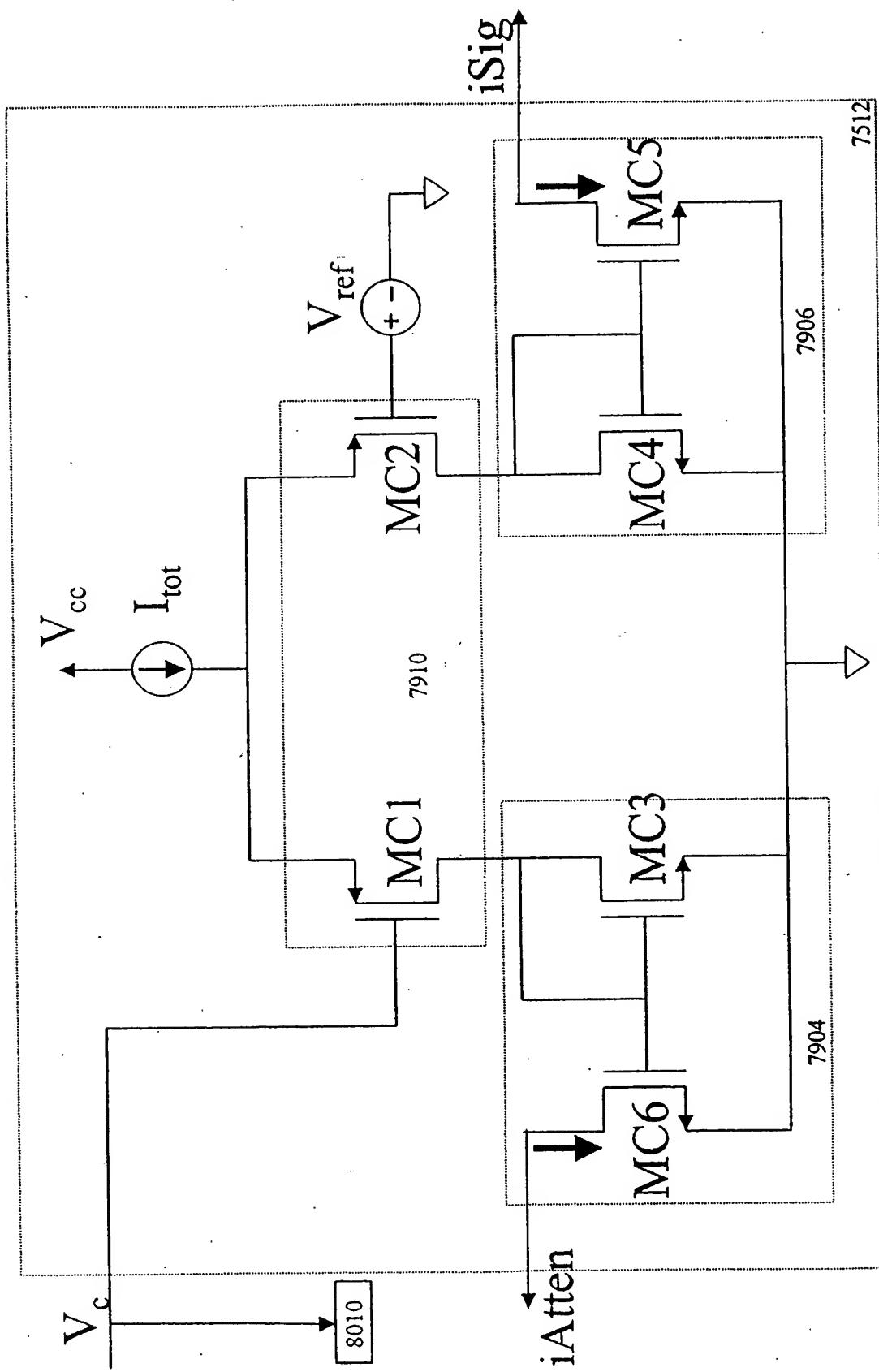


FIG. 7.9

FIG. 80

